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ARMY CONCEPTS ANALYSIS AGENCY BETHESDA MD
CONCEPTS EVALUATION MODEL V (CEN V). PART III. USER'S HANDBOOK, (U)
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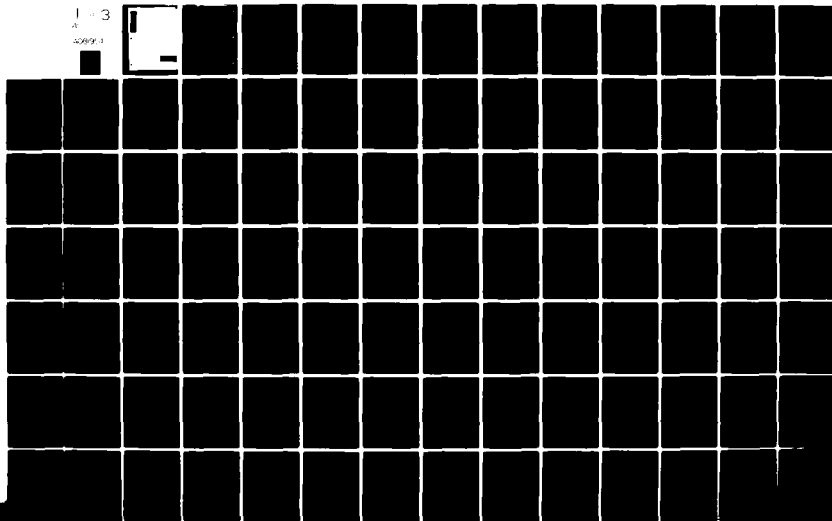
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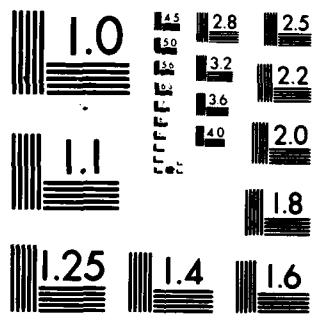
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This document provides a complete description of the input data and their formats required for the CEM V, as well as a description of the reports generated by the CEM V and its postprocessor. The structure of the CEM V input data deck is indicated, and an explanation of the error diagnostic messages produced by the CEM V preprocessor is included. References are provided to Parts I and II of the CEM V documentation, where more complete explanations are given of how the input data are used by the CEM V and how they should be derived.

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CONCEPTS EVALUATION MODEL V
(CEM V)

PART III - USER'S HANDBOOK

February 1980

Prepared by

CEM GROUP

US Army Concepts Analysis Agency
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PART I - TECHNICAL DESCRIPTION (published separately, 1980)

PART II - INPUT DERIVATION (published separately)*

PART III - CEM V USER'S HANDBOOK

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*Louer, P.E., Forrester, R.E., Parker, R.W., Shepherd, J.E., Tunstall, J.E., and Willyard, H.A., Conceptual Design for the Army in the Field Alternative Force Evaluation - CONAF Evaluation Model IV: Part I - Model Description; Part II - Input Derivations; Part III - User's Handbook; McLean, Va., General Research Corporation, Dec 74

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CONCEPTS EVALUATION MODEL V (CEM V)

PART III - CEM V USER'S HANDBOOK

CHAPTER 1

CEM V INPUT DATA STRUCTURE

1-1. Data inputs required by CEM are organized into six sections: RUN, SCENARIO, UNITS, CONSTANT, AIR, and TABLES (see Figure 1-1). The presentation format and the structure of each of these sections moves from macro through micro description. Individual sample card formats providing parameter inputs and their description are included. For more information concerning the utilization of some input parameters in CEM, page references to other parts of this report are included. Each input data section and logical subsections, if any, are illustrated. Card columns designated as "Blank" must remain free of any punched information.

1-2. Illustrative error messages that may be generated by the data inputs in the preprocessor (not by the operating system) and diagnostics for each section are presented. In addition, Section Card, Sequence Check, and Data Subroutine errors applicable to each of the six section decks have been included under a separate, concluding heading.

1-3. It should be noted that the data error messages produced by the CEM preprocessor are printed immediately following the input card containing the error. The user can determine from the preprocessor listing the section--RUN, SCENARIO, etc.--in which the error has been detected. It is for this reason that the error messages/diagnostics pertinent to a particular section deck are included herein with the descriptive material for the appropriate section rather than under a separate "Error Message/Diagnostics" subheading.

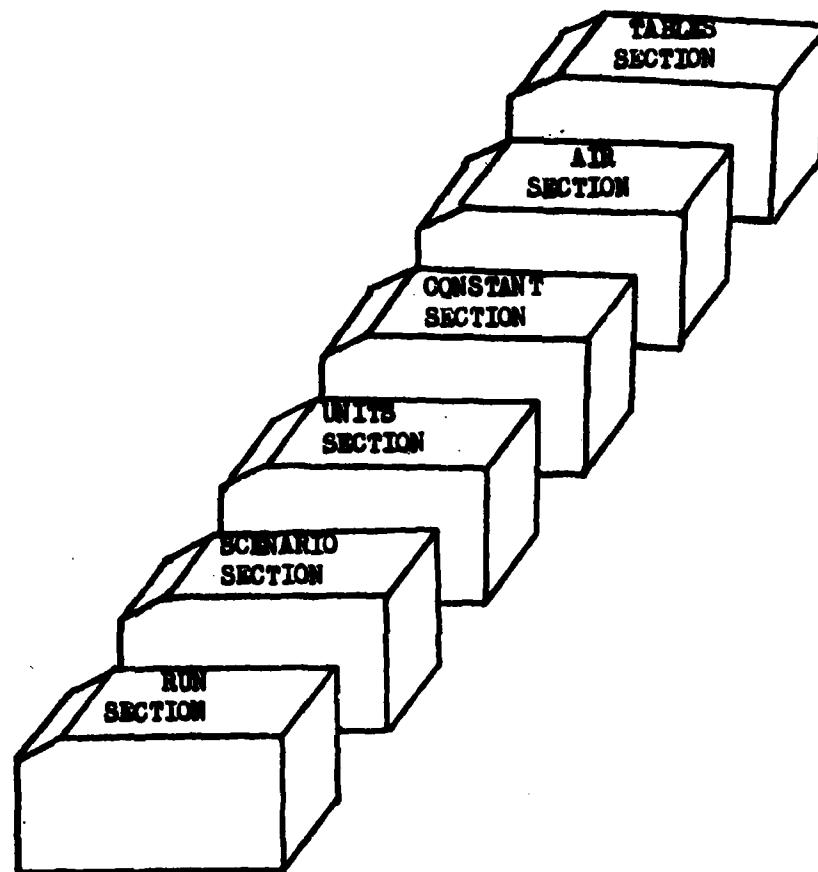
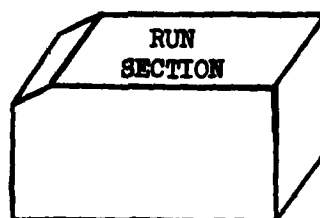


Figure 1-1. Input Data Deck Structure

RUN SECTION



The Run Section sets up limits and levels of resolution that control the execution of the CEM program. Formats and descriptions are included as follows:

Input Data Card Listing

Run Section Card

Run Title Card

Run Cycle Specification Card

Report Options Card

Error Options Card

TOS Options Card

Input Count Cards

Run Section Error Messages/Diagnostics

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SECTION	RUN	SECTION	5	
RUNTITLE	04	SAMPLE RUN	SECTION	1
RUNLIMIT	4	2	1	0
PRINTOUT	STANDARD	1	SCAL THFR	10
ERRORTN	DUMP			
BLUE TOS	NO			
COUNTS	33	1	10	6
COUNTS	17	3	42	5

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RUN SECTION CARD

FORMAT

2A4,2X,2A4,2X,2A4,2X,I5,37X,A3,I5

Col 1- 8	"SECTION" first card of section 1 (left justified)
Col 9-10	Blank
Col 11-18	"RUN" section name (left justified)
Col 19-20	Blank
Col 21-28	"SEQCOMNT" ignore out of sequence cards, but comment (does not terminate preprocessor) (left justified) "SEQABORT" abort preprocessor run if col 76-80 not in sequence (ascending order) "SEQIGNOR" ignore and do not comment on any out of sequence cards
Col 29-30	Blank
Col 31-35	Logical input unit from which this section of data can be read by preprocessor (right justified)
Col 36-72	Optional comments
Col 73-75	Hollerith sequence label (not checked by pre- processor)
Col 76-80	Sequence number

Notes: Col 21-28 options deal with cards in this section only.

Col 31-35: if logical input unit is zero or missing,
input will be read from logical unit 5.

CAA-D-80-3

RUN TITLE CARD

FORMAT

2A4,2X,15A4,2X,A3,I5

Col 1- 8

"RUNTITLE"

Col 9-10

Blank

Col 11-70

Title user wishes to be printed with reports

Col 71-72

Blank

Col 73-75

Hollerith sequence label (not checked by pre-processor)

Col 76-80

Sequence number

RUN CYCLE AND SUPPRESSION CARD

FORMAT

2A4,2X,6I5,32X,A3,I5

Col 1- 8	"RUNLIMIT"
Col 9-10	Blank
Col 11-15	Number of theater cycles model is to run, > 0
Col 16-20	Number of army cycles per theater cycle, > 0, ≤ 7
Col 21-25	Number of corps cycles per army cycle, > 0
Col 26-30	Number of division cycles per corps cycle, > 0
Col 31-35	ON/OFF for model suppression logic, OFF = "0" or "blank," ON = "1"
Col 36-40	Not used
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

REPORT OPTIONS CARD

FORMAT	2A4,2X,2A4,2X,I5,5X,A4,1X,A4,1X,I5,10X,2I5, 3I2,I1,A3,I5
Col 1- 8	"PRNTOPTN"
Col 9-10	Blank
Col 11-18	"STANDARD"-Standard Theater Summary Report
Col 21-25	Number of theater cycles which each theater re- port will cover, > 0*
Col 26-30	Blank
Col 31-34	Blank = Both scaled and fixed scale FEBA maps reported "SCAL" = Scaled FEBA map report reported "FIXD" = Constant scale FEBA map reported
Col 35	Blank
Col 36-39	"DIV" = Logistic report at end of each division cycle and theater cycle "THTR" = Logistic report at end of last divi- sion cycle per theater cycle and theater cycle
Col 40	Blank
Col 41-45	Vertical scale value for theater FEBA map in minisectors per line of print (a zero or blank will default to 5 minisectors per line)
Col 46-55	Not used
Col 56-60	Division cycles covered for FEBA and tactical reports
Col 61-65	Time interval in days for bde freq report
Col 66-67	ON/OFF for combat unit trace**
Col 68-69	Not used
Col 70-71	ON/OFF for ADDCOP system**
Col 72	ON/OFF for WARF data***
Col 73-75	Sequence label
Col 76-80	Sequence number

*Not presently operational in CEM postprocessor. CEM prepro-
cessor requires input card as shown above.

**Blank = OFF, 1 = ON

***Blank = No WARF data generated
1,2,3 = Partition for WARF data (authorized levels)

ERROR OPTIONS CARD

FORMAT

2A4,2X,2A4,54X,A3,15

Col 1- 8

"ERROPTN"

Col 9-10

Blank

Col 11-18

"NODUMP" = If error detected by CEM, no core
dump will be given. "DUMP" = If error detected
by CEM, core will be dumped

Col 19-72

Blank

Col 73-75

Sequence label

Col 76-80

Sequence number

Note: These options concern CEM-detected errors only, not
system-detected errors.

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TOS OPTIONS CARD

FORMAT 2A4,6X,A4,54X,A3,I5

Col 1- 8	"BLUE TOS"
Col 9-14	Blank
Col 15-18	"YES" = Blue will have increased ability to detect Red upcoming situation. (This switch permits Blue to examine Red's upcoming deployment/estimate as a function of the intelligence coefficients (e and f) where e = 1.0 gives perfect information on upcoming cycle, and f = 1.0 gives perfect information of last cycle.)
	"NO" = no TOS simulated
Col 19-20	Blank
Col 21-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

INPUT COUNT CARD*

FORMAT	2A4,2X,6I5,7I3,11X,A3,I5
Col 1- 8	"COUNTS"
Col 9-10	Blank
Col 11-15	Quantity of maneuver unit bn types for this side
Col 16-20	Quantity of armies for this side**
Col 21-25	Quantity of reinforcing divisions
Col 26-30	Quantity of cards "ARRVDVSN" which specify the arrival schedule of the reinforcing divisions in theater (max 50 cards)
Col 31-35	Quantity of cards "ARRVARTY" which specify the arrival schedule of the reinforcing artillery in theater (max 50 cards)
Col 36-40	Quantity of cards "LOGISTIC" which specify the arrival schedule of the replacement to resupply in theater (max 50 different theater cycles)
Col 41-43	Count of tank type weapons, ≤ 12
Col 44-46	Count of light armor type weapons, ≤ 12
Col 47-49	Count of helicopter type weapons (Blue side only), ≤ 5
Col 50-52	Count of antitank/mortar type weapons, ≤ 12
Col 53-58	Not used
Col 59-61	Number of cards "ARRMAINT" which specify the time-phased maintenance capacity
Col 62-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Two cards (Blue and Red); Red follows Blue.

**Quantity Blue armies, $> 0, \leq 6$.
 Quantity Red armies, $> 0, \leq 12$.

RUN SECTION ERROR
MESSAGES/DIAGNOSTICS

****ILLEGAL ERROR OPTION"

The "ERROPTN" card may only contain one of the following options in cols 11-18. The entry must start in col 11.

1. "NODUMP"
2. "DUMP"

****NONPOSITIVE CYCLE COUNT"

An entry on the "RUNLIMIT" card is less than or equal to zero (0).

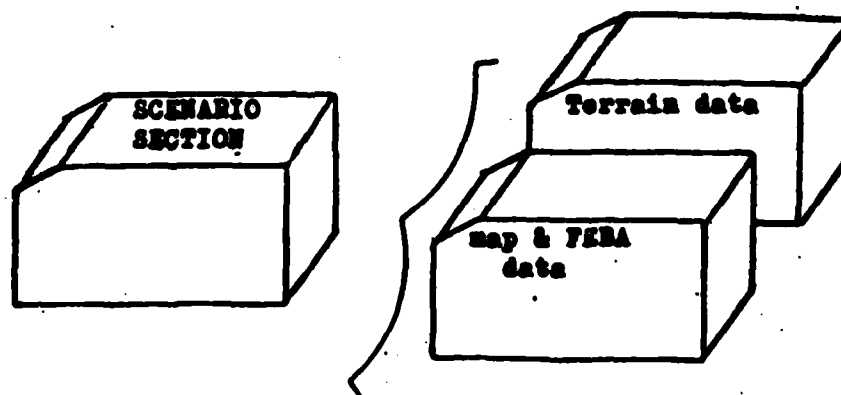
****NUMBER OF ARMY CYCLES PER THEATER CYCLE GREATER THAN SEVEN"

On the "RUNLIMIT" card the user has specified more than seven (7) army cycles per theater cycle.

****ILLEGAL TOS OPTION"

The "BLUE TOS" card may have only "YES" or "NO" in col 15-18, right justified.

SCENARIO SECTION



The Scenario Section defines the theater battlefield size, level of resolution of terrain, and the initial FEBA. The following descriptions are included:

Sample Terrain Data Layout

Sample Input Data Card Listing*

Scenario Section Card

Minisector Description Card

Initial FEBA Location Card

Map End Points Card

Movement Factors Card

Default Terrain Card

Terrain Description Card

Additional Terrain Description

Scenario Section Error Messages/Diagnostics Description

*This listing details a portion of the input data cards required to "Code" the terrain as illustrated on the Sample Terrain Data Layout ("map").

C

SCENARIO SECTION CARD

FORMAT 2A4,2X,2A4,2X,2A4,2X,I5,37X,A3,I5

Col 1- 8	"SECTION" first card of section 2
Col 9-10	Blank
Col 11-18	"SCENARIO" section name
Col 19-20	Blank
Col 21-28	"SEQCOMNT" ignore out of sequence cards, but comment (does not terminate preprocessor)
	"SEQABORT" abort preprocessor run if Col 76-80 not in sequence (ascending order)
	"SEQIGNOR" ignore and do not comment on any out of sequence cards
Col 29-30	Blank
Col 31-35	Logical input unit where this section of data will be read by preprocessor
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

MINISECTOR/WEAK DIVISION CARD

FORMAT

2A4,2X,4I5,F5.2,2I5,3F5.0,12X,A3,I5

Col 1- 8	"MINISCTR"
Col 9-10	Blank
Col 11-15	Number of minisectors in theater, $> 0, \leq 1,000$
Col 16-20	Number of minisectors per terrain band, $> 0^*$
Col 21-25	Minimum Blue division frontage ≥ 2 minisectors
Col 26-30	Minimum Red division frontage, ≥ 1 minisector
Col 31-35	Force density ratio of flanks to front
Col 36-40	Maximum allowable flank in hectometers
Col 41-45	Maximum number of divisions which can exist in an army reserve pool,** max ≤ 9 .
Col 46-50	If the defense switch is "on" (cols 41-45 > 0), and the Blue division's atk/def DRIFP is greater than this entry, and the Blue division is at minimum frontage +1 minisector, the Blue division is "tagged" as a weak division
Col 51-55	If the ratio of IFP X STATE of the strongest army's reserve division to the army's weakest on-line division is greater than this entry, the strongest army reserve division will replace the weakest on-line division
Col 56-60	Not used
Col 61-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

*Number of minisectors/terrain band \leq number of minisectors in the theater. There may not be more than 100 terrain bands in the theater.

**If this entry is zero (0), the defense switch is considered off. If this entry is negative, it indicates the maximum size of the army reserve pools, while weak on-line division replacement is prevented.

INITIAL FEBA LOCATION CARD

FORMAT

2A4,2X,3(3I5,5X),2X,A3,I5

Col 1- 8	"FEBALOCN"
Col 9-10	Blank
Col 11-15	Low minisector boundary (minisectors are numbered from top (low) to bottom (high))
Col 16-20	High minisector boundary
Col 21-25	FEBA coordinates which fall between the high and low minisector coordinates defined in col 11-15, 16-20
Col 26-30	Blank
Col 31-35	Low minisector boundary for segment 2 of FEBA (should there be more than 1 segment)
Col 36-40	High minisector boundary for segment 2
Col 41-45	FEBA coordinate for segment 2
Col 46-50	Blank
Col 51-55	Same as Col 31-35 (for segment 3)
Col 56-60	Same as Col 36-40 (for segment 3)
Col 61-65	Same as Col 41-45 (for segment 3)
Col 66-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence numbers

Notes: Additional "FEBALOCN" card would be for segments 4-6, 7-9, etc., until all minisectors in the theater have been assigned a FEBA coordinate.

Up to three FEBA locations may be defined on one card and there may be more than one card defining the FEBA for the theater.

MAP END POINTS CARD

FORMAT 2A4,2X,12I5,2X,A3,I5

Col 1- 8	"ENDPNTS" This card describes the edge of the battlefield (for each 100 minisectors) in basic terrain coordinates, such as hectometers
Col 9-10	Blank
Col 11-15	Minisector 1-100 western edge of battlefield
Col 16-20	Minisector 1-100 eastern edge of battlefield
Col 21-25	Minisector 101-200 western edge
Col 26-30	Minisector 101-200 eastern edge
Col 31-35	Minisector 201-300 western edge
Col 36-40	Minisector 201-300 eastern edge
Col 41-45	Minisector 301-400 western edge
Col 46-50	Minisector 301-400 eastern edge
Col 51-55	Minisector 401-500 western edge
Col 56-60	Minisector 401-500 eastern edge
Col 61-65	Minisector 501-600 western edge
Col 66-70	Minisector 501-600 eastern edge
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: Should there be more than 600 minisectors to the theater frontage an additional card "ENDPNTS" must be used. This card specifies the FEBA coordinates beyond which the FEBA will not advance. A pair of coordinates is specified for each hundred minisectors of the theater. If the FEBA within those minisectors falls below the first (lower) coordinate, Red will not advance further. Similarly, if the FEBA within those minisectors exceeds the second (higher) coordinate, Blue will not advance further within those minisectors.

0 ≤ end pt ≤ 16,383.

MOVEMENT FACTORS CARD

FORMAT

2A4,2X,4F5.0,42X,A3,I5

Col 1- 8	"MOVEFCTR"
Col 9-10	Blank
Col 11-15	Exponential smoothing coefficient, W*
Col 16-20	Threshold used only by Red to estimate whether Blue has prepared defense (or barrier). If the computed average FEBA movement rate is less than this threshold, Red estimates that Blue is in a prepared defense (or barrier), otherwise Red estimates the defense as hasty*
Col 21-25	Threshold to determine if Red is in a prepared or hasty defense for both estimation and actual engagement. Comparison is made as described above*
Col 26-30	FEBA movement modifier applied when assessing outcome and Blue mission is delay with a barrier**
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*See para 5-2c in Part I for explanation of defensive position determinations.

**See para 5-4h in Part I for explanation of this modifier.

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DEFAULT TERRAIN CARD

FORMAT 2A4,3X,A4,57X,A3,I5

Col 1- 8	"DFLTTERN"
Col 9-14	Blank
Col 15	Default terrain Type A or B or C. On subsequent cards the terrain type(s) within each terrain band will be specified; where terrain is not specified the default terrain type will be assumed
Col 16-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: Type D terrain may not be default type.

On subsequent "TERRAIN" cards the default terrain may not appear.

TERRAIN DESCRIPTION CARD

FORMAT

2A4,2X,4(2I5,1X,A4)2X,A3,I5

Col 1- 8	"TERRAIN"
Col 9-10	Blank
Col 11-15	Low FEBA coordinate* (if Type D terrain enter index number)
Col 16-20	High FEBA coordinate* (Type D terrain is always 1 hm wide)
Col 21-24	Blank
Col 25	Terrain class A, B, C, or D (may not be default terrain)
Col 26-30	Same as Col 11-15
Col 31-35	Same as Col 16-20
Col 36-39	Blank
Col 40	Same as Col 25
Col 41-45	Same as Col 11-15
Col 46-50	Same as Col 16-20
Col 51-54	Blank
Col 55	Same as Col 25
Col 56-60	Same as Col 11-15
Col 61-65	Same as Col 16-20
Col 66-69	Blank
Col 70	Same as Col 25
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

*Low FEBA coordinate-west, high FEBA coordinate-east.

Notes: Entries for a single terrain band must be in ascending FEBA coordinate order.

See following page for additional information.

TERRAIN DESCRIPTION CARD (continued)

The preprocessor recognizes the start and end of each terrain band as follows:

1. Each terrain band coded must begin in the first field of a card (Col 11-15, low FEBA coordinate).
2. The end of a terrain band is recognized when a blank entry is encountered.

The Type D terrain previously mentioned is considered the roughest terrain (mountains, rivers, etc.) with Type A terrain considered the best suited for travel. When coding Type D terrain each continuous river and/or mountain is coded with an identifying index number so as to differentiate it from other Type D terrain. Each indexed Type D terrain may be one terrain band in length or several (\leq quantity of terrain bands defined in the "MINISCTR" card).

SCENARIO SECTION ERROR
MESSAGES/DIAGNOSTICS

***FEBA NOT SPECIFIED FOR MINISECTOR ____ "
"TOTAL ____ "

In defining the initial FEBA one or more minisectors within the theater frontage have not been assigned FEBA locations.

***INPUT VALUE OUT OF RANGE ON ABOVE CARD"

Number of terrain bands in the theater is less than zero (0) or greater than one hundred (100).

***INCONSISTENCY IN ENTRY XX ON ABOVE CARD"

In defining the initial FEBA location one of the following has occurred:

1. Low minisector coordinate is ≤ 0 .
2. Low minisector coordinate is $>$ number of minisector coordinates defined on the "MINISCTR" card, Cols 11-15.
3. High minisector coordinate is ≤ 0 .
4. High minisector coordinate is $>$ number of minisector coordinates defined on the "MINISCTR" card, Cols 11-15.
5. Low minisector coordinate is $>$ high minisector coordinate.

***NUMBER OF ENTRIES FOR THIS TERRAIN BAND EXCEEDS MAXIMUM"

A maximum fifty (50) variations per terrain band has been exceeded.

***DATA INCONSISTENCY ON ABOVE CARD"

A low minisector coordinate on card image listed above this message is greater than the high minisector coordinate defined for this terrain type.

***ENTRIES FOR THIS TERRAIN BAND NOT IN ASCENDING KM ORDER"

The coordinates given for a terrain type are not in ascending sequence from left to right, i.e.:

1. The low coordinate is \leq the high coordinate for the previous terrain type within this terrain band.
2. The high coordinate is \leq the high coordinate for the previous terrain type within the terrain band.

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***NUMBER OF TERRAIN BANDS REQUIRED EXCEEDS 100"

A maximum of 100 terrain bands has been exceeded. The "MINISCTR" card defines

1. The total minisectors in the theater.
2. The quantity of minisectors per terrain band.
Item 1 divided by item 2 = terrain band in theater.

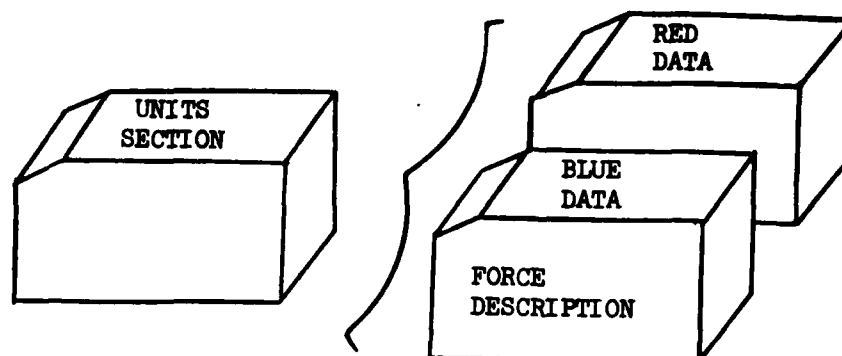
***DEFAULT TERRAIN NOT A, B, OR C"

The default terrain specified on the "DFLTTERN" card Col 15 must be either A, B, or C. (D type terrain may not be default terrain.)

***MAP END PTS. INCONSISTENT WITH FEBA"

The initial FEBA has some segment located outside the boundaries of the map end points.

UNITS SECTION



The Units Section describes the composition, organization, and initial deployment of the Red and Blue forces. Formats and descriptions are as follows:

Blue Force Input Deck Structure, Figure 1-2

Sample Blue Force Input Data Card Listing

Red Force Input Deck Structure, Figure 1-3

Sample Red Force Input Data Card Listing

Unit Section Card

Initial Mission Card

Artillery Type Card

Artillery Neutralization and Vulnerability Card

Static and Reserve Effects Cards

Counterbattery Vulnerability Cards

Artillery Cannon Type Cards

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Artillery Battalion Type Cards
Artillery Intelligence Card
Weapon Description Cards
Maneuver Bn Description Cards
Maneuver Bn Intelligence Cards
Initial Nondivisional Artillery Counts Card
Army Description Card
Corps Description Card
Blue Division Description Card
Blue Brigade Description Card (1)
Blue Brigade Description Card (2)
Red Division Description Card
Red Regiment Description Card
Reinforcing Division Arrival Card
Artillery Reinforcing Schedule Card
Logistical Arrival Card
Maintenance Capacity Card
Unit Section Error Messages/Diagnostics Description

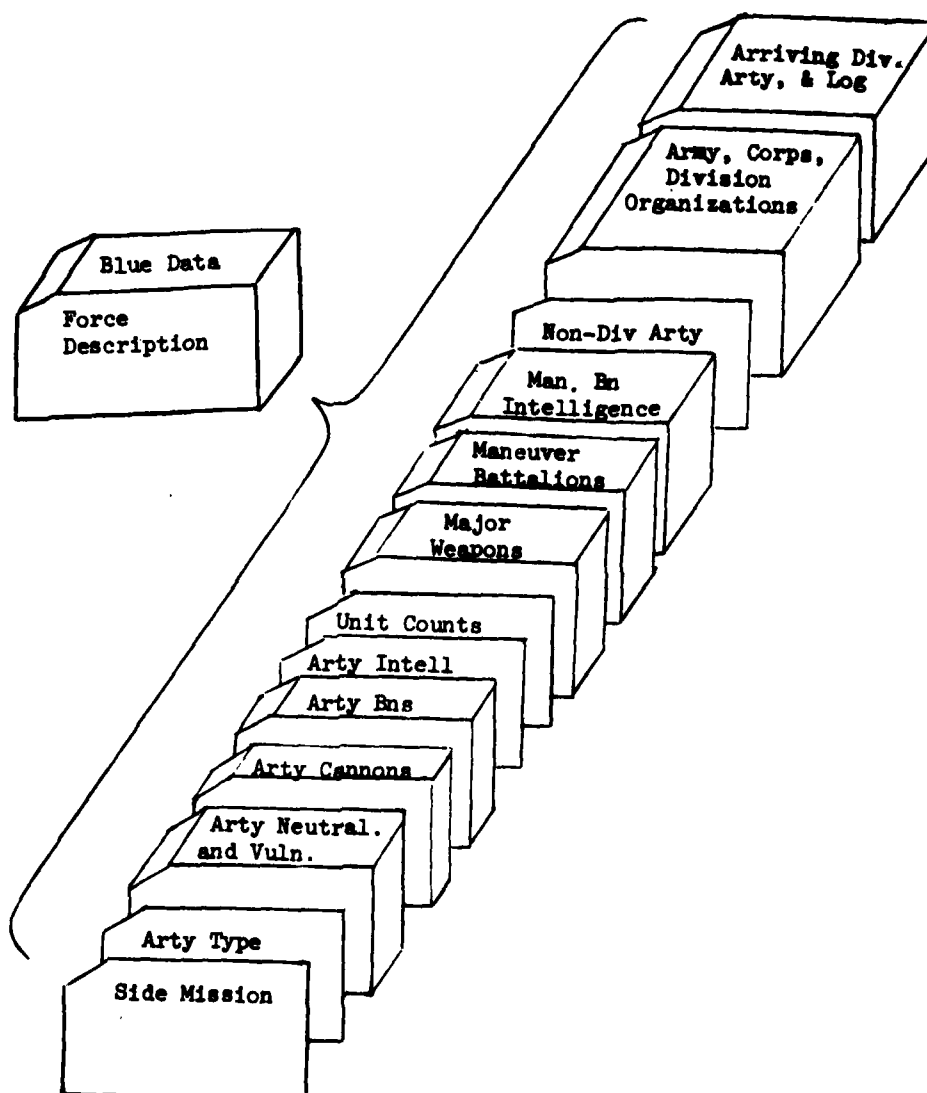


Figure 1-2. Blue Force Input Deck Structure

SECTION	UNITS	SECTIONOR	5							00001200
MISSION	DEFEND	0.	0.	0.	0.6	0.6	1.0	1.0		00001300
ARTYTYPE	01	01								00001400
ARTYFCT1	0.1.0030.0120	.01.0010								00001500
ARTYFCT2	.5479									00001600
ARTYFCT2	.4437.3183.3207									00001700
ARTYFCT3	.9									00001800
ARTYFCT3	3.0									00001900
ARTYTUBE	11.0001	.36 .91 1.1						TUBE TYPE 1 143		00002000
ARTYIFPS	.0000.0000.0000.0000.0000.0000.0000.0000.0000.0000							ATFP		00002100
ARTYIFPS	.0000.0000.0000.0000.0000.0000.0000.0000.0000.0000							ALAFP		00002200
ARTYIFPS	.0560.0858.0969.0954.1490.1490.0856.0618							APFP		00002300
ARTYDSEX	2.08 3.47 3.47 2.77 4.33 4.33 2.56 2.50							DS AHMO		00002400
ARTYDSEX	.001 .001 .098 .000 .000 .029 2.67 .80							DS		00002500
ARTYBNTF	198 0499 1 18							BN TYPE 1		00002600
ARTYINTL	1.0 .0									00002700
TANKTYPE	4 1.6 0.8	.54 .53 1.0 95.					TYPE 1 TANK			00002800
TANKKFAC	.75 0.9 .75 .47 .62 .45 .47									00002900
WPNTYPE2	.0164 .0221 .0218 .0323 .0551 .0568 .0276									00003000
WPNTYPE3	.0052 .0041 .0041 .0122 .0209 .0235 .0104									00003100
WPNTYPE4	.0061 .0099 .0102 .0086 .0142 .0142 .0084									00003200
WPNTYPE5										00003300
WPNTYPE6	.0404 .0672 .0672 .0537 .0884 .0884 .0522 .0302 .0044									00003400
WPNTYPE7	1.0 1.0									00003500
DESTROYD	0.60 0.42 0.42 0.42 0.14 0.68							TYPE 1 LARM		00003600
LARNTYPE	2 0.8 0.4	.36 .11 0.8 90.					1.2			00003700
LARKKFAC	2.2 2.6 2.6 1.0 1.6 1.0									00003800
WPNTYPE2	.0000 .0000 .0000 .0000 .0000 .0000 .0000									00003900
WPNTYPE3	.0028 .0033 .0033 .0051 .0086 .0086 .0049									00004000
WPNTYPE4	.0063 .0106 .0103 .0081 .0134 .0134 .0081									00004100
WPNTYPE5										00004200
WPNTYPE6	.0013 .0022 .0022 .0017 .0028 .0028 .0017 .0010 .0001									00004300
WPNTYPE7	1.0 1.0									00004400
DESTROYD	0.19 0.19 0.19 0.19 0.19 0.31							TYPE 2 LARM		00004500
LARNTYPE	4 0.8 0.4	.36 .11 0.8 90.					1.2			00004600
LARKKFAC	2.2 2.6 2.6 1.0 1.6 1.0									00004700
WPNTYPE2	.0186 .0248 .0248 .0298 .0491 .0491 .0290									00004800
WPNTYPE3	.0045 .0044 .0044 .0085 .0140 .0140 .0083									00004900
WPNTYPE4	.0000 .0000 .0000 .0000 .0000 .0000 .0000									00005000
WPNTYPE5										00005100
WPNTYPE6	.0048 .0080 .0080 .0064 .0105 .0105 .0062 .0036 .0005									00005200
WPNTYPE7	1.0 1.0									00005300
DESTROYD	0.40 0.10 0.10 0.10 0.09 0.31							TYPE 1 MELO		00005400
HELOTYPE	2 0.8 0.4 .28 2.3 92.									00005500
WPNTYPE2	.1500 .2000 .2000 .2406 .3900 .3900 .2200									00005600
WPNTYPE3	.0363 .0340 .0340 .0690 .1128 .1128 .0666									00005700
WPNTYPE4	.0000 .0000 .0000 .0000 .0000 .0000 .0000									00005800
WPNTYPE5										00005900
WPNTYPE6	.0111 .0185 .0185 .0148 .0243 .0243 .0144 .0083 .0012									00006000
WPNTYPE7	1.0 1.0									00006100
ATNKTYPE	6									00006200
ATNKKFAC	.75000 .75000 .75000 .75000 .75000 .75000 .75000									00006300
WPNTYPE2	.0000 .0000 .0000 .0000 .0000 .0000 .0000									00006400
WPNTYPE3	.0000 .0000 .0000 .0000 .0000 .0000 .0000									00006500
WPNTYPE4	.0180 .0270 .0312 .0320 .0540 .0540 .0309									00006600
WPNTYPE5										00006700
WPNTYPE6	.0871 .1447 .1447 .1161 .1959 .1959 .1157 .0645 .0138									00006800

WPNTYPE7	1.0	1.0											00006600
ATNKTPE	5												00006700
ATNKTAC	.75000	.75000	.75000	.75000	.75000	.75000	.75000						00006800
WPNTYPE2	.0048	.0060	.0060	.0082	.0147	.0147	.0086						00006900
WPNTYPE3	.0010	.0010	.0010	.0020	.0037	.0037	.0021						00007000
WPNTYPE4	.0000	.0000	.0000	.0000	.0000	.0000	.0000						00007100
WPNTYPE5													00007200
WPNTYPE6		.0008	.0013	.0013	.0010	.0019	.0019	.0011	.0005	.0001			00007300
WPNTYPE7	1.0	1.0											00007400
MNBNTYPE	285.	.000	.000	.000	.000	.000	.000	.000	.000				00007500
MNBNTYP1		.000	.000	.000	.000	.000	.000	.000					00007600
MNBNTYP2		.010	.016	.016	.013	.022	.022	.013					00007700
MNBNTYP3													00007800
MNBNTYP4	56.6	.00	.00	.00	.00	.00	.00	.00	.00	.00			00007900
MNBNTYP5													00008000
MNBNTYP6	54	0	0	0	0	0	0	0	0	0	0		00008100
MNBNTYP7	18	4	0	0	0	0	0	0	0	0	0		00008200
MNBNTYP8	0	0	0	0	0								00008300
MNBNTYP9	4	4	0	0	0	0	0	0	0	0	0		00008400
MNBNTYPE	346.	.000	.000	.000	.000	.000	.000	.000					00008500
MNBNTYP1		.000	.000	.000	.000	.000	.000	.000					00008600
MNBNTYP2		.010	.016	.016	.013	.022	.022	.013					00008700
MNBNTYP3													00008800
MNBNTYP4	26.2	.00	.00	.00	.00	.00	.00	.00	.00	.00			00008900
MNBNTYP5													00009000
MNBNTYP6	54	0	0	0	0	0	0	0	0	0	0		00009100
MNBNTYP7	18	4	0	0	0	0	0	0	0	0	0		00009200
MNBNTYP8	0	0	0	0	0								00009300
MNBNTYP9	4	4	0	0	0	0	0	0	0	0	0		00009400
MNBNTYPE	664.	.000	.000	.000	.000	.000	.000	.000					00009500
MNBNTYP1		.004	.005	.005	.008	.014	.014	.008					00009600
MNBNTYP2		.106	.179	.178	.145	.243	.243	.145					00009700
MNBNTYP3													00009800
MNBNTYP4	52.0	.03	.05	.05	.04	.07	.07	.04	.02	.00			00009900
MNBNTYP5													00010000
MNBNTYP6	0	0	0	0	0	0	0	0	0	0	0		00010100
MNBNTYP7	63	22	00	0	0	0	0	0	0	0	0		00010200
MNBNTYP8	0	0	0	0	0								00010300
MNBNTYP9	4	40	0	0	0	0	0	0	0	0	0		00010400
MNBNTYPE	63.	.000	.000	.000	.000	.000	.000	.000					00010500
MNBNTYP1		.001	.001	.001	.001	.003	.003	.001					00010600
MNBNTYP2		.023	.039	.039	.032	.053	.053	.032					00010700
MNBNTYP3													00010800
MNBNTYP4	18.2	.01	.01	.01	.01	.01	.01	.01	.00	.00			00010900
MNBNTYP5													00011000
MNBNTYP6	12	0	0	0	0	0	0	0	0	0	0		00011100
MNBNTYP7	12	6	0	0	0	0	0	0	0	0	0		00011200
MNBNTYP8	1	0	0	0	0								00011300
MNBNTYP9	3	6	0	0	0	0	0	0	0	0	0		00011400
MNBNTYPE	155.	.000	.000	.000	.000	.000	.000	.000					00011500
MNBNTYP1		.000	.000	.000	.000	.000	.000	.000					00011600
MNBNTYP2		.000	.000	.000	.000	.000	.000	.000					00011700
MNBNTYP3													00011800
MNBNTYP4	5.1	.00	.00	.00	.00	.00	.00	.00	.00	.00			00011900
MNBNTYP5													00012000
MNBNTYP6	0	0	0	0	0	0	0	0	0	0	0		00012100
MNBNTYP7	0	0	0	0	0	0	0	0	0	0	0		00012200

MNBNTYP8	21	0	0	0	0	0	0	0	0	0	0	0	00012300	
MNBNTYP9	0	0	0	0	0	0	0	0	0	0	0	0	00012400	
MNBNTINTL	0.80	.20											00012500	
MNBNTINTL	0.80	.20											00012600	
MNBNTINTL	0.80	.20											00012700	
MNBNTINTL	0.80	.20											00012800	
MNBNTINTL	0.80	.20											00012900	
INITARTY	0	5	14	0	7	11	5	11					00013000	
ARMY	FIRST		1	100	1								00013100	
CORPS	1		1	100	2				A				200013200	
CORPMELI	000		00	0	00	0	00	0					00013300	
CORPMELI													00013400	
DIVISION	M1		001	050		01	01	A		4.8	01	01	01	100013500
DVSNMELI	100		04	03	05	02	00	00	00	00	00	00	00	00013600
BRIGADE	100	A	001	017	2	0	2	0	0	0	0	0	0	00013700
BRIGADE	100	A	018	035	2	0	2	0	0	0	0	0	0	00013800
BRIGADE	100	A	036	050	1	0	2	0	0	0	0	0	0	00013900
DIVISION	T1		051	100		01	01	A		4.8	01	01	01	100014000
DVSNMELI	100		04	03	05	02	00	00	00	00	00	00	00	00014100
BRIGADE	100	A	051	068	1	1	2	0	0	0	0	0	0	00014200
BRIGADE	100	A	069	084	1	1	2	0	0	0	0	0	0	00014300
BRIGADE	100	A	085	100	2	0	1	0	0	0	0	0	0	00014400
DIVISION	M2		000	000		01	01	A		4.8	01	01	01	100014500
DVSNMELI	100		04	03	05	02	00	00	00	00	00	00	00	00014600
BRIGADE	100	A	000	000	2	0	2	0	0	0	0	0	0	00014700
BRIGADE	100	A	000	000	2	0	2	0	0	0	0	0	0	00014800
BRIGADE	100	A	000	000	1	0	2	0	0	0	0	0	0	00014900
DIVISION	T2		000	000		01	01	A		4.8	01	01	01	100015000
DVSNMELI	100		04	03	05	02	00	00	00	00	00	00	00	00015100
BRIGADE	100	A	000	000	1	1	2	0	0	0	0	0	0	00015200
BRIGADE	100	A	000	000	1	1	2	0	0	0	0	0	0	00015300
BRIGADE	100	A	000	000	2	0	1	0	0	0	0	0	0	00015400
ARRVDVSN	1	0	0	1	2									00015500
ARRVARTY	2		5	0	0	0	0	0	0					00015600
LOGISTIC	0 1	1	0 2	1	0 2	2	0 3	1	0 4	1		0		00015700
LOGISTIC	0 4	2	0 5	1	0 6	1	0 7	1	0 8	1		0		00015800
LOGISTIC	0 9	1	0 0	1	0									00015900
LOGISTIC	1 1	1	0 2	1	0 2	2	0 3	1	0 4	1		44		00016000
LOGISTIC	1 4	2	44 5	1	0 6	1	73.0 7	1	0 8	1	2.204			00016100
LOGISTIC	1 9	1	228.0 0	1	5									00016200
LOGISTIC	2 1	1	0 2	1	0 2	2	0 3	1	0 4	1		44		00016300
LOGISTIC	2 4	2	44 5	1	0 6	1	0 7	1	0 8	1	2.204			00016400
LOGISTIC	2 9	1	5.714 0	1	0									00016500
LOGISTIC	3 1	1	0 2	1	0 2	2	0 3	1	0 4	1		44		00016600
LOGISTIC	3 4	2	44 5	1	5 6	1	0 7	1	0 8	1	2.204			00016700
LOGISTIC	3 9	1	5.714 0	1	0									00016800
LOGISTIC	4 1	1	0 2	1	30 2	2	30 3	1	5 4	1		44		00016900
LOGISTIC	4 4	2	44 5	1	5 6	1	0 7	1	0 8	1	2.204			00017000
LOGISTIC	4 9	1	5.714 0	1	5									00017100
LOGISTIC	5 1	1	150 2	1	100 2	2	100 3	1	5 4	1		44		00017200
LOGISTIC	5 4	2	44 5	1	5 6	1	0 7	1	0 8	1	2.204			00017300
LOGISTIC	5 9	1	5.714 0	1	0									00017400
LOGISTIC	6 1	1	150 2	1	0 2	2	39 3	1	5 4	1		44		00017500
LOGISTIC	6 4	2	44 5	1	5 6	1	0 7	1	0 8	1	2.204			00017600
LOGISTIC	6 9	1	5.714 0	1	0									00017700
LOGISTIC	7 1	1	150 2	1	0 2	2	0 3	1	5 4	1		44		00017800
LOGISTIC	7 4	2	44 5	1	5 6	1	0 7	1	0 8	1	2.204			00017900
LOGISTIC	7 9	1	5.714 0	1	0									00018000
LOGISTIC	8 1	1	180 2	1	0 2	2	0 3	1	5 4	1		44		00018100
LOGISTIC	8 4	2	44 5	1	5 6	1	0 7	1	0 8	1	2.204			00018200
LOGISTIC	8 9	1	5.714 0	1	0									00018300
ARPMINT	00		0086	094	020	180	200	020						00018400

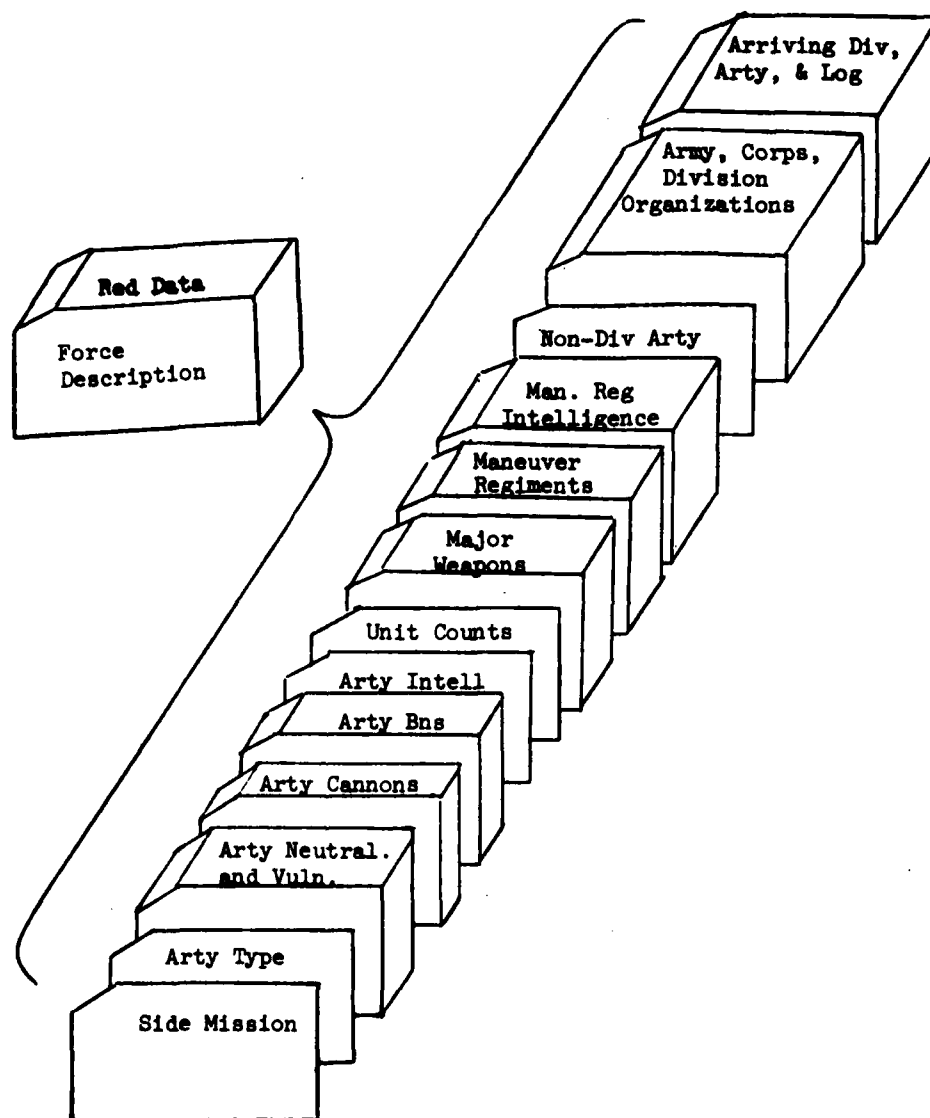


Figure 1-3. Red Force Input Deck Structure

CAA-D-80-3

MISSION	ATTACK	8.	8.	8.	0.6	0.6	0.8	0.4		00018500
ARTYTYPE	01 01									00018600
ARTYFCT1	0.1.0124 .035 .04.0035									00018700
ARTYFCT2	.1292									00018800
ARTYFCT2	.2029.2029									00018900
ARTYFCT3	3.5									00019000
ARTYFCT3	6.0									00019100
ARTYTUBE	7.0001									00019200
ARTYIFPS	.0000.0000.0000.0000.0000.0000.0000.0000								TUBE1	00019300
ARTYIFPS	.0000.0000.0000.0000.0000.0000.0000.0000								ATFP	00019400
ARTYIFPS	.1964.3311.3311.2118.2742.2744.1645.1981								AL AFP	00019500
ARTYDSEX	1.27 2.15 2.15 1.38 1.72 1.72 1.03 1.24								APFP	00019600
ARTYGSEX	.001.0005 .211.0005 .000 .063 1.32 .39								DS AMMO	00019700
ARTYBNTF	126 246 1 18								OS	00019800
ARTYINTL	1.0 .0								ARTY BN 1	00019900
TANKTYPE	3 1.6 .8									00020000
TANKKFAC	.75 0.6 .98 .75 1.2 1.3 1.2								TYPE 1 TANK	00020100
WPNTYPE2	.0603 .1209 .1170 .0606 .0546 .0563 .0370									00020200
WPNTYPE3	.0199 .0402 .0391 .0230 .0126 .0128 .0111									00020300
WPNTYPE4	.0170 .0296 .0296 .0180 .0196 .0191 .0118									00020400
WPNTYPE5										00020500
WPNTYPE6	.4983 .8446 .8446 .5130 .6412 .6412 .3847 .2876 .0421									00020600
WPNTYPE7										00020700
DESTROYD	0.50 0.33 0.33 0.42 0.30 0.68									
LARMTYPE	4 2.0 1.0 .35 .35 0.6 98.								TYPE 1 LARM	00020800
LARMKFAC	1.2 1.0 1.5 1.0 2.5 2.5 2.2									00020900
WPNTYPE2	.0251 .0438 .0441 .0262 .0181 .0180 .0148									00021000
WPNTYPE3	.0075 .0135 .0135 .0079 .0078 .0078 .0051									00021100
WPNTYPE4	.0160 .0270 .0270 .0164 .0200 .0204 .0121									00021200
WPNTYPE5										00021300
WPNTYPE6	.1276 .2162 .2162 .1313 .1641 .1641 .0985 .0736 .0108									00021400
WPNTYPE7										00021500
DESTROYD	0.10 0.10 0.10 0.14 0.20 0.68									
LARMTYPE	4 .8 .4 .56 .16 0.6 98.								TYPE 2 LARM	00021600
LARMKFAC	1.2 1.0 1.5 1.0 2.5 2.5 2.2									00021700
WPNTYPE2	.0000 .0000 .0000 .0000 .0000 .0000 .0000									00021800
WPNTYPE3	.0027 .0060 .0059 .0034 .0033 .0034 .0018									00021900
WPNTYPE4	.0163 .0270 .0270 .0164 .0208 .0217 .0127									00022000
WPNTYPE5										00022100
WPNTYPE6	.0523 .0887 .0887 .0539 .0673 .0673 .0404 .0302 .0044									00022200
WPNTYPE7										00022300
DESTROYD	0.10 0.10 0.10 0.14 0.20 0.68									
HELOTYPE	2 0.8 0.4 .28 2.3 92.								TYPE 1 HELO	00022400
WPNTYPE2	.0336 .0644 .0644 .0377 .0234 .0234 .0213									00022500
WPNTYPE3	.0215 .0438 .0433 .0251 .0118 .0119 .0124									00022600
WPNTYPE4	.0147 .0290 .0290 .0170 .0160 .0152 .0102									00022700
WPNTYPE5										00022800
WPNTYPE6	.3555 .6783 .6783 .3982 .4525 .4525 .2910 .2049 .1079									00022900
WPNTYPE7										00023000
ATNKTYPE	6								TYPE 1 ATNK	00023100
ATNKKFAC	1.0001 1.0001 1.0001 1.0020 1.0020 1.0001 1.0001									00023200
WPNTYPE2	.0000 .0000 .0000 .0000 .0000 .0000 .0000									00023300
WPNTYPE3	.0000 .0000 .0000 .0000 .0000 .0000 .0000									00023400
WPNTYPE4	.1558 .2806 .2806 .1656 .1508 .1366 .0896									00023500
WPNTYPE5										00023600
WPNTYPE6	.94921.60791.6079 .94921.18421.1842 .7124 .5292 .1147									00023700
WPNTYPE7										00023800

ATNKTYPE	2	TYPE 2 ATNK										
ATNKKFAC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	00023900
WPNTYPE2	.0060	.0112	.0112	.0063	.0071	.0070	.0042					00024000
WPNTYPE3	.0029	.0055	.0055	.0031	.0036	.0034	.0020					00024100
WPNTYPE4	.0000	.0000	.0000	.0000	.0000	.0000	.0000					00024200
WPNTYPE5												00024300
WPNTYPE6		.0203	.0345	.0345	.0193	.0241	.0241	.0145	.0099	.0021		00024400
WPNTYPE7												00024500
MNBNTYPE	6770	.000	.000	.000	.000	.000	.000	.000				00024600
MNBNTYP1		.000	.000	.000	.000	.000	.000	.000				00024700
MNBNTYP2		2.494	4.168	4.168	2.516	3.057	3.185	1.864				00024800
MNBNTYP3												00024900
MNBNTYP4	2677.1	2.39	4.07	4.07	2.46	3.05	3.05	1.83	1.36	.30		00025000
MNBNTYP5												00025100
MNBNTYP6	322	0	0	0	0	0	0	0	0	0		00025200
MNBNTYP7	134	63	0	0	0	0	0	0	0	0	9	00025300
MNBNTYP8	0	0	0	0	0	0	0	0	0	0		00025400
MNBNTYP9	18	162	0	0	0	0	0	0	0	0		00025500
MNBNTYPE	200.	.000	.000	.000	.000	.000	.000	.000	.000			00025600
MNBNTYP1		.000	.000	.000	.000	.000	.000	.000				00025700
MNBNTYP2		.000	.000	.000	.000	.000	.000	.000				00025800
MNBNTYP3												00025900
MNBNTYP4	45.2	.00	.00	.00	.00	.00	.00	.00	.00	.00		00026000
MNBNTYP5												00026100
MNBNTYP6	0	0	0	0	0	0	0	0	0	0	0	00026200
MNBNTYP7	0	0	0	0	0	0	0	0	0	0	0	00026300
MNBNTYP8	10	0	0	0	0	0	0	0	0	0	0	00026400
MNBNTYP9	0	0	0	0	0	0	0	0	0	0	0	00026500
MNBINTL	0.80	.20										00026600
MNBINTL	0.80	.20										00026700
INITARTY	7											00026800
ARMY	REDFNT-1	1	50	1								00026900
CORPS	REDARM01	1	50	4								00027000
DIVISION	ST 1	001	012	1	1	4	1	1	100	A		00027100
DIVISION		1100000000000000										00027200
DIVISION	ST 2	013	025	1	1	4	1	1	100	A		00027300
DIVISION		1100000000000000										00027400
DIVISION	ST 3	026	038	1	1	4	1	1	100	A		00027500
DIVISION		1100000000000000										00027600
DIVISION	ST 4	039	050	1	1	4	1	1	100	A		00027700
DIVISION		1100000000000000										00027800
ARMY	REDFNT-2	51	100	2								00027900
CORPS	REDARM02	51	75	2						A		00028000
DIVISION	ST 5	051	063	1	1	4	1	1	100	A		00028100
DIVISION		1100000000000000										00028200
DIVISION	ST 6	064	075	1	1	4	1	1	100	A		00028300
DIVISION		1100000000000000										00028400
CORPS	REDARM03	76	100	2						A		00028500
DIVISION	ST 7	076	088	1	1	4	1	1	100	A		00028600
DIVISION		1100000000000000										00028700
DIVISION	ST 8	089	100	1	1	4	1	1	100	A		00028800
DIVISION		1100000000000000										00028900
DIVISION	ST 9	000	000	1	1	4	1	1	100	A		00029000
DIVISION		1100000000000000										00029100
DIVISION	ST 10	000	000	1	1	4	1	1	100	A		00029200
DIVISION		1100000000000000										00029300
DIVISION	ST 11	000	000	1	1	4	1	1	100	A		00029400
DIVISION												00029500

[illegible]

UNITS SECTION CARD

FORMAT 2A4,3X,2A4,2X,2A4,2X,I5,37X,A3,I5

Col 1- 8	"SECTION"
Col 9-10	Blank
Col 11-18	"UNITS"
Col 19-20	Blank
Col 21-28	"SEQCOMNT" ignore out of sequence cards, but comment (does not terminate preprocessor)
	"SEQABORT" abort preprocessor run if out of se- quenced cards encountered
	"SEQIGNOR" ignore and do not comment on out of sequenced cards
Col 29-30	Blank
Col 31-35	Logical input unit for this section of data
Col 36-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

INITIAL MISSION/SUPPLY PARAMETER CARD

FORMAT 2A4,2X,2A4,3F6.0,4F6.3,3F4.2,A3,I5

Col 1- 8	"MISSION"
Col 9-10	Blank
Col 11-18	Initial mission of theater (by side-Blue, then side-Red) "DELAY," "DEFEND", "ATTACK" (left justified)
Col 19-24	Supply rationing "n" for POL*
Col 25-30	Supply rationing "n" for AMMO*
Col 31-36	Supply rationing "n" for OTHER*
Col 37-42	Firepower constraint "P" for personnel POL**
Col 43-48	Firepower constraint "Q" for personnel POL**
Col 49-54	Firepower constraint "P" for personnel OTHER**
Col 55-60	Firepower constraint "Q" for personnel OTHER**
Col 61-64	POL availability factor, ≤ 1.0 ***
Col 65-68	AMMO availability factor, ≤ 1.0 ***
Col 69-72	OTHER availability factor, ≤ 1.0 ***
Col 73-75	Sequence label
Col 76-80	Sequence number

*Enter whole number with decimal; cannot be less than 1.0.

**Values for "Q" must be greater than zero and less than or equal to one. Values for "P" may range from zero to one. "P" and "Q" for AMMO are hardwired as zero and one, respectively. See para 5-3e of Part I for explanation of these factors.

***Applies to Blue only. Example, if Blue is to be restricted to use at most 90 percent of this available supply, then the value should be .90. Designed for use where "P" and "Q" values are "0" and "1," respectively and n = 1.0. Default = 1.0.

ARTILLERY TYPE/GS PARTITIONING CARD

FORMAT 2A4,2X,2I5,3F5.2,37X,A3,I5

Col 1- 8	"ARTYTYPE"
Col 9-10	Blank
Col 11-15	Quantity of artillery bn types (1-15)
Col 16-20	Quantity of artillery cannon types (1-8)
Col 21-25	Fraction of nondiv GS arty drawing ammo resupply from Blue partition 1 (e.g., 0.52)*
Col 26-30	Fraction of nondiv GS arty drawing ammo resupply from Blue partition 2*
Col 31-35	Fraction of nondiv GS arty drawing ammo resupply from Blue partition 3*
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Fields may be left blank, or 1, 2, or 3 entries may be made. Ammunition drawdown will be from the source partition according to these percentages. Blank causes the model to function in the 1-0-0 mode, i.e., no partitioning.

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ARTILLERY NEUTRALIZATION AND PERSONNEL VULNERABILITY FACTORS

(One card required for each side)

FORMAT 2A4,2X,5F5.0,I5,32X,A3,I5

Col 1- 8	"ARTYFCT1"
Col 9-10	Blank
Col 11-15	"K1" arty bn neutralization vulnerability factor from enemy counterbattery fire. ¹ The neutralization effect is also used in modifying AT and ALA firepower
Col 16-20	"K2" personnel vulnerability factor from enemy CB fire ²
Col 21-25	"K4" static ³ unit personnel vulnerability factor. Blue brigade or Red division in reserve to the total area over which enemy GS fire would be distributed ⁴
Col 31-35	"K6" reserve unit personnel vulnerability factor
Col 36-40	Blank
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

-
1. $DSAP_f = DSAP \cdot [1 - \exp(-"K1" \cdot CBAP_e / Bns_f Engaged)]$
 2. $CAS_{CB} = PERS \cdot [1 - \exp(-"K2" \cdot CBAP_e / Bns_f Engaged)]$
 3. $CAS_s = PERS \cdot [1 - \exp(-"K4" \cdot DSAP_e / Minisectors)]$
 4. $CAS_R = PERS \cdot [1 - \exp(-"K6" \cdot p \cdot GSAP_e)]$

Note: For explanation of algorithms, see the following paragraphs in Part I:

- No. 1 - para 5-3f
- No. 2 - para 5-4g
- No. 3 - para 5-4e
- No. 4 - para 5-4f

TANK DAMAGE COEFFICIENTS IN STATIC AND RESERVE

(One card required for each side)

FORMAT 2A4,2X,12F5.0,2X,A3,15

Col 1- 8	"ARTYFCT2"
Col 9-10	Blank
Col 11-15	Vulnerability coefficient "K5" of tank type 1
Col 16-20	Vulnerability coefficient "K5" of tank type 2
Col 21-25	Vulnerability coefficient "K5" of tank type 3
Col 26-30	Vulnerability coefficient "K5" of tank type 4
Col 31-35	Vulnerability coefficient "K5" of tank type 5
Col 36-40	Vulnerability coefficient "K5" of tank type 6
Col 44-45	Vulnerability coefficient "K5" of tank type 7
Col 46-50	Vulnerability coefficient "K5" of tank type 8
Col 51-55	Vulnerability coefficient "K5" of tank type 9
Col 56-60	Vulnerability coefficient "K5" of tank type 10
Col 61-65	Vulnerability coefficient "K5" of tank type 11
Col 66-70	Vulnerability coefficient "K5" of tank type 12
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

$$H_T = T_n \cdot [1 - \exp(-"K5" \cdot \text{ATFP} / \Sigma T_t)]$$

For explanation of algorithm, see para 5-4a of Part I.

Notes: ATFP includes the sum of artillery and close air support.

AT firepower in this engagement.

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APC DAMAGE COEFFICIENTS IN STATIC AND RESERVE

(One card required for each side)

FORMAT 2A4,2X,12F5.0,2X,A3,I5

Col 1- 8	"ARTYFCT2"
Col 9-10	Blank
Col 11-15	Vulnerability coefficient "K5" of APC type 1
Col 16-20	Vulnerability coefficient "K5" of APC type 2
Col 21-25	Vulnerability coefficient "K5" of APC type 3
Col 26-30	Vulnerability coefficient "K5" of APC type 4
Col 31-35	Vulnerability coefficient "K5" of APC type 5
Col 36-40	Vulnerability coefficient "K5" of APC type 6
Col 41-45	Vulnerability coefficient "K5" of APC type 7
Col 46-50	Vulnerability coefficient "K5" of APC type 8
Col 51-55	Vulnerability coefficient "K5" of APC type 9
Col 56-60	Vulnerability coefficient "K5" of APC type 10
Col 61-65	Vulnerability coefficient "K5" of APC type 11
Col 66-70	Vulnerability coefficient "K5" of APC type 12
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

$$H_{APC} = APC_n \cdot [1 - \exp(-"K5" \cdot ALAFP / \sum APC_t)]$$

For explanation of algorithm, see para 5-4a of Part I.

Note: ALAFP includes the sum of artillery and close air support. ALA firepower in the engagement.

COUNTERBATTERY CANNON VULNERABILITY FACTOR CARD, Card 1 of 2

(One card for ATPF for each side)*

FORMAT	2A4,2X,8F5.2,22X,A3,I5
Col 1- 8	"ARTYFCT3"
Col 9-10	Blank
Col 11-15	"K3" vulnerability factor for friendly tube 1 from enemy GS Arty + CAS CB ATPF
Col 16-20	"K3" vulnerability factor for friendly tube 2 from enemy GS Arty + CAS CB ATPF
Col 21-25	"K3" vulnerability factor for friendly tube 3 from enemy GS Arty + CAS CB ATPF
Col 26-30	"K3" vulnerability factor for friendly tube 4 from enemy GS Arty + CAS CB ATPF
Col 31-35	"K3" vulnerability factor for friendly tube 5 from enemy GS Arty + CAS CB ATPF
Col 36-40	"K3" vulnerability factor for friendly tube 6 from enemy GS Arty + CAS CB ATPF
Col 41-45	"K3" vulnerability factor for friendly tube 7 from enemy GS Arty + CAS CB ATPF
Col 46-50	"K3" vulnerability factor for friendly tube 8 from enemy GS Arty + CAS CB ATPF
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*AT input factors must appear on card 1 of 2.

Note: See para 5-4g of Part I for a description of how these counterbattery vulnerability factors are employed.

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COUNTERBATTERY CANNON VULNERABILITY FACTOR CARD, Card 2 of 2

(One card for ALA for each side)*

FORMAT 2A4,2X,8F5.2,22X,A3,I5

Col 1- 8	"ARTYFCT3"
Col 9-10	Blank
Col 11-15	"K3" vulnerability factor for friendly tube 1 from enemy GS Arty + CAS CB ALAFP
Col 16-20	"K3" vulnerability factor for friendly tube 2 from enemy GS Arty + CAS CB ALAFP
Col 21-25	"K3" vulnerability factor for friendly tube 3 from enemy GS Arty + CAS CB ALAFP
Col 26-30	"K3" vulnerability factor for friendly tube 4 from enemy GS Arty + CAS CB ALAFP
Col 31-35	"K3" vulnerability factor for friendly tube 5 from enemy GS Arty + CAS CB ALAFP
Col 36-40	"K3" vulnerability factor for friendly tube 6 from enemy GS Arty + CAS CB ALAFP
Col 41-45	"K3" vulnerability factor for friendly tube 7 from enemy GS Arty + CAS CB ALAFP
Col 46-50	"K3" vulnerability factor for friendly tube 8 from enemy GS Arty + CAS CB ALAFP
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*ALA input factors must appear on Card 2 of 2.

Note: See para 5-4g of Part I for a description of how these counterbattery vulnerability factors are employed.

ARTY CANNON TYPE CARD, Card 1 of 6

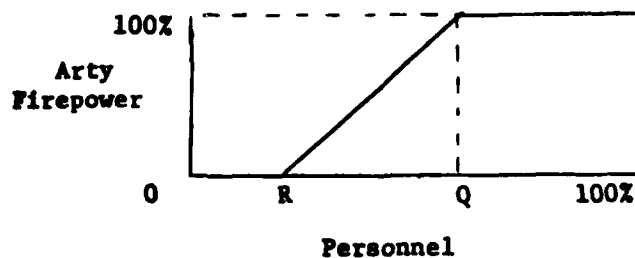
(One card required for artillery cannon type)

FORMAT

2A4,2X,8F5.0,22X,A3,I5

Col 1- 8	"ARTYTUBE"
Col 9-10	Blank
Col 11-15	Personnel per cannon (normal crew)
Col 16-20	Breakdown rate - non-repairable at site
Col 21-25	Blank (not available for optional comment)
Col 26-30	R constraint - fraction of normal crew personnel below which cannon cannot be effectively employed*
Col 31-35	Q constraint - fraction of normal crew personnel below which cannon firepower becomes less effective*
Col 36-40	Factor to represent increased expenditure for DS artillery (see para 6-2a of Part I)
Col 41-50	Blank
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Should a shortage of personnel exist within an artillery bn, a constraint on firepower is applied as suggested in the following graph:



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ARTY AT IFP CARD, Card 2 of 6

(One card required for each artillery cannon type)

FORMAT	2A4,2X,8F5.0,22X,A3,I5
Col 1- 8	"ARTYIFPS"
Col 9-10	Blank
Col 11-15	DS antitank (AT) IFP for Blue attack Delay (BAD)
Col 16-20	DS antitank (AT) IFP for Blue attack Prepared Defense (BAPD)
Col 21-25	DS antitank (AT) IFP for Blue attack Hasty Defense (BAHD)
Col 26-30	DS antitank (AT) IFP for Meeting Engagement (ME)
Col 31-35	DS antitank (AT) IFP for Red attack Hasty Defense (RAHD)
Col 36-40	DS antitank (AT) IFP for Red attack Prepared Defense (RAPD)
Col 41-45	DS antitank (AT) IFP for Red attack Delay (RAD)
Col 46-50	DS antitank (AT) IFP for Static Engagement (QUIET)
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

ARTY ALA IFP CARD, Card 3 of 6

(One card required for each artillery cannon type)

FORMAT	2A4,2X,8F5.0,22X,A3,I5
Col 1- 8	"ARTYIFPS"
Col 9-10	Blank
Col 11-15	DS antilight armor (ALA) IFP for Blue attack Delay
Col 16-20	DS antilight armor (ALA) IFP for Blue attack Prepared Defense
Col 21-25	DS antilight armor (ALA) IFP for Blue attack Hasty Defense
Col 26-30	DS antilight armor (ALA) IFP for Meeting Engagement
Col 31-35	DS antilight armor (ALA) IFP for Red attack Hasty Defense
Col 36-40	DS antilight armor (ALA) IFP for Red attack Prepared Defense
Col 41-45	DS antilight armor (ALA) IFP for Red attack Delay
Col 46-50	DS antilight armor (ALA) IFP for Static Engage- ment
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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ARTY AP IFP CARD, Card 4 of 6

(One card required for each artillery cannon type)

FORMAT 2A4,2X,8F5.0,22X,A3,15

Col 1- 8	"ARTYIFPS"
Col 9-10	Blank
Col 11-15	DS antipersonnel (AP) IFP for Blue attack Delay
Col 16-20	DS antipersonnel (AP) IFP for Blue attack Prepared Defense
Col 21-25	DS antipersonnel (AP) IFP for Blue attack Hasty Defense
Col 26-30	DS antipersonnel (AP) IFP for Meeting Engagement
Col 31-35	DS antipersonnel (AP) IFP for Red attack Hasty Defense
Col 36-40	DS antipersonnel (AP) IFP for Red attack Prepared Defense
Col 41-45	DS antipersonnel (AP) IFP for Red attack Delay
Col 46-50	DS antipersonnel (AP) IFP for Static Engagement
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

ARTY DS AMMO EXPENDITURE CARD, Card 5 of 6

(One card required for each artillery cannon type)

FORMAT	2A4,2X,8F5.0,22X,A3,I5
Col 1- 8	"ARTYDSEX"
Col 9-10	Blank
Col 11-15	DS Arty ammo expenditure (in tons)* for Blue attack Delay
Col 16-20	DS Arty ammo expenditure (in tons)* for Blue attack Prepared Defense
Col 21-25	DS Arty ammo expenditure (in tons)* for Blue attack Hasty Defense
Col 26-30	DS Arty ammo expenditure (in tons)* for Meeting Engagement
Col 31-35	DS Arty ammo expenditure (in tons)* for Red attack Hasty Defense
Col 36-40	DS Arty ammo expenditure (in tons)* for Red attack Prepared Defense
Col 41-45	DS Arty ammo expenditure (in tons)* for Red attack Delay
Col 46-50	DS Arty ammo expenditure (in tons)* for Static Engagement
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence numbers

Per division cycle (12 hours).

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ARTY GS FIREPOWER AND AMMO EXPENDITURE CARD, Card 6 of 6

(One card required for each artillery cannon type)

FORMAT 2A4,2X,8F5.0,22X,A3,I5

Col 1- 8	"ARTYGSEX"
Col 9-10	Blank
Col 11-15	GS antitank (AT) IFP for Counterbattery fire
Col 16-20	GS antilight armor (ALA) IFP for Counterbattery fire
Col 21-25	GS antipersonnel (AP) IFP for Counterbattery fire
Col 26-30	GS antitank (AT) IFP against Reserve units
Col 31-35	GS antilight armor (ALA) IFP against Reserve units
Col 36-40	GS antipersonnel (AP) IFP against Reserve units
Col 41-45	GS arty ammo expenditure (tons/12 hrs) for Counterbattery fire
Col 46-50	GS arty ammo expenditure (tons/12 hrs) against Reserve units
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

ARTY BN TYPE CARD

(One card required for each artillery bn type)

FORMAT	2A4,2X,8F5.0,22X,A3,I5
Col 1- 8	"ARTYBNTTP"
Col 9-10	Blank
Col 11-15	Total cannon crew personnel authorized for the arty bn
Col 16-20	Total tons of artillery ammo in arty bn
Col 21-25	Tube type "X" in arty bn
Col 26-30	Quantity of tube type "X" in arty bn
Col 31-35	Tube type "Y" in arty bn
Col 36-40	Quantity of tube type "Y" in arty bn
Col 41-45	Tube type "Z" in arty bn
Col 46-50	Quantity of tube type "Z" in arty bn
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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ARTILLERY INTELLIGENCE CARD

FORMAT 2A4,2X,3F5.0,47X,A3,I5

Col 1- 8	"ARTYINTL"
Col 9-10	Blank
Col 11-15	This entry is for estimating DS artillery fire- power. The "a" coefficient in Col 11-15 (see detailed write-up on intelligence equation, para 6-2d in Part I)
Col 16-20	The "b" coefficient
Col 21-25	The "c" coefficient
Col 26-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: These entries, a, b and c, represent the enemy's ability to detect and estimate the amount of effective artillery firepower in direct support. The sum of a, b, and c is not required to be 1; but a warning is issued if the sum is not 1.

WEAPON DESCRIPTION (Tank) CARD

FORMAT

2A4,3X,3F5.0,6F4.2,23X,A3,I5

Col 1- 8	"TANKTYPE"
Col 9-10	Blank
Col 11-15	Quantity of personnel in crew
Col 16-20	Quantity of casualties to crew, given a kill
Col 21-25	Quantity of crew casualties wounded, given a kill*
Col 26-41	Not used
Col 42-45	Breakdowns per 100 weapons engaged
Col 46-49	Percent of breakdowns repairable**
Col 50-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Crew KIA equals total crew casualties minus crew casualties wounded.

**All other breakdowns are nonrepairable and are counted as permanent losses. Example of entry, 95., not .95 or 95

Note: See para 5-4a of Part I for algorithm employing the above damage factors and the factors contained on the TANKKFAC card.

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DAMAGE COEFFICIENT (Tank) CARD

FORMAT 2A4,2X,8F7.0,6X,A3,I5

Col 1- 8	"TANKKFAC"
Col 9-10	Blank
Col 11-17	Damage coefficient (K-factor) for BAD
Col 18-24	Damage coefficient (K-factor) for BAPD
Col 25-31	Damage coefficient (K-factor) for BAHD
Col 32-38	Damage coefficient (K-factor) for ME
Col 39-45	Damage coefficient (K-factor) for RAHD
Col 46-52	Damage coefficient (K-factor) for RAPD
Col 53-59	Damage coefficient (K-factor) for RAD
Col 60-72	Not used*
Col 73-75	Sequence label
Col 76-80	Sequence number

*Damage coefficients for tanks in STATIC and RESERVE postures are contained on the ARTYFCT2 card (K5 factors).

WEAPON DESCRIPTION (Light Armor) CARD

FORMAT	2A4,2X,3F5.0,6F4.2,23X,A3,I5
Col 1- 8	"LARMTYPE"
Col 9-10	Blank
Col 11-15	Quantity of personnel in crew
Col 16-20	Quantity of casualties to crew, given a kill
Col 21-25	Quantity of crew casualties wounded, given a kill*
Col 26-29	Enemy AP IFP per minisector at which 50 percent suppression of friendly AT firepower is caused**
Col 30-33	Enemy AP IFP per minisector at which 100 percent suppression of friendly AT firepower is caused**
Col 34-41	Not used
Col 42-45	Breakdowns per 100 weapons engaged
Col 46-49	Percent of breakdowns repairable***
Col 50-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Crew KIA equals total crew casualties minus crew casualties wounded.

**Value for 50 percent suppression < value for 100 percent suppression. ON/OFF for suppression is contained on RUNLIMIT card.

***All other breakdowns are nonrepairable and are counted as permanent losses. Example of entry, 95., not .95 or 95

Note: See para 5-4a of Part I for algorithm employing the above damage factors and the factors contained on the TANKKFAC card.

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DAMAGE COEFFICIENT (Light Armor) CARD

FORMAT 2A4,2X,8F7.0,6X,A3,I5

Col 1- 8	"LARMKFAC"
Col 9-10	Blank
Col 11-17	Damage coefficient (K-factor) for BAD
Col 18-24	Damage coefficient (K-factor) for BAPD
Col 25-31	Damage coefficient (K-factor) for BAHd
Col 32-38	Damage coefficient (K-factor) for ME
Col 39-45	Damage coefficient (K-factor) for RAHD
Col 46-52	Damage coefficient (K-factor) for RAPD
Col 53-59	Damage coefficient (K-factor) for RAD
Col 60-72	Not used*
Col 73-75	Sequence label
Col 76-80	Sequence number

*Damage coefficients for light armor in STATIC and RESERVE postures are contained on the ARTYFCT2 card (K5 factors).

WEAPON DESCRIPTION (Helicopter, Blue side only) CARD

FORMAT

2A4,2X,3F5.0,3F4.2,35X,A3,I5

Col 1- 8	"HELOTYPE"
Col 9-10	Blank
Col 11-15	Quantity of personnel in crew
Col 16-20	Quantity of casualties to crew, given a kill
Col 21-25	Quantity of crew casualties wounded, given a kill
Col 26-29	Fraction of helicopters downed that may be retrievable
Col 30-33	Breakdown rate/100 weapons
Col 34-37	Percent of breakdowns repairable
Col 38-49	Blank
Col 50-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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WEAPON DESCRIPTION (Antitank, Mortar) CARD

FORMAT 2A4,2X,3F5.0,6F4.2,23X,A3,I5

Col 1- 8	"ATNKTYPE"
Col 9-10	Blank
Col 11-15	Quantity of personnel in crew*
Col 16-25	Not used
Col 26-29	Enemy AP IFP per minisector at which 50 percent suppression of friendly AT firepower is caused
Col 30-33	Enemy AP IFP per minisector at which 100 percent suppression of friendly AT firepower is caused
Col 34-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

*In order for a replacement AT/M weapon to be issued to a unit, sufficient personnel must be present in the unit's status file to provide crews for the replacement weapons.

ANTITANK/MORTAR LOSS RATE FACTOR CARD

FORMAT

2A4,2X,8F7.0,A3,I5

Col 1- 8	"ATNKKFAC"
Col 9-10	Blank
Col 11-17	Weapon loss rate factor (R-factor) for BAD
Col 18-24	Weapon loss rate factor (R-factor) for BAPD
Col 25-31	Weapon loss rate factor (R-factor) for BAHD
Col 32-38	Weapon loss rate factor (R-factor) for ME
Col 39-45	Weapon loss rate factor (R-factor) for RAHD
Col 46-52	Weapon loss rate factor (R-factor) for RAPD
Col 53-59	Weapon loss rate factor (R-factor) for RAD
Col 60-66	Weapon loss rate factor (R-factor) for STATIC
Col 67-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: See para 5-4b of Part I for algorithm employing these factors.

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WEAPON DESCRIPTION (AT IFP) CARD

FORMAT 2A4,2X,7F6.2,20X,A3,I5

Col 1- 8	"WPNTYPE2"
Col 9-10	Blank
Col 11-16	AT IFP per weapon for BAD
Col 17-22	AT IFP per weapon for BAPD
Col 23-28	AT IFP per weapon for BAHD
Col 29-34	AT IFP per weapon for ME
Col 35-40	AT IFP per weapon for RAHD
Col 41-46	AT IFP per weapon for RAPD
Col 47-52	AT IFP per weapon for RAD
Col 53-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: Above IFP values are per division cycle.

WEAPON DESCRIPTION (ALA IFP) CARD

FORMAT 2A4,2X,7F6.2,20X,A3,I5

Col 1- 8	"WPNTYPE3"
Col 9-10	Blank
Col 11-16	ALA IFP per weapon for BAD
Col 17-22	ALA IFP per weapon for BAPD
Col 23-28	ALA IFP per weapon for BAHD
Col 29-34	ALA IFP per weapon for ME
Col 35-40	ALA IFP per weapon for RAHD
Col 41-46	ALA IFP per weapon for RAPD
Col 47-52	ALA IFP per weapon for RAD
Col 53-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: Above IFP values are per division cycle.

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WEAPON DESCRIPTION (AP IFP) CARD

FORMAT 2A4,2X,7F6.2,20X,A3,I5

Col 1- 8	"WPNTYPE4"
Col 9-10	Blank
Col 11-16	AP IFP per weapon for BAD
Col 17-22	AP IFP per weapon for BAPD
Col 23-28	AP IFP per weapon for BAHD
Col 29-34	AP IFP per weapon for ME
Col 35-40	AP IFP per weapon for RAHD
Col 41-46	AP IFP per weapon for RAPD
Col 47-52	AP IFP per weapon for RAD
Col 53-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: Above IFP values are per division cycle.

WEAPON DESCRIPTION (POL Rqmts) CARD

FORMAT

2A4,2X,2F4.2,9F6.2,A3,I5

Col 1- 8	"WPNTYPE5"
Col 9-10	Blank
Col 11-14	POL "P" modifier for rationing POL, if required
Col 15-18	POL "Q" modifier for rationing POL, if required
Col 19-24	POL requirements (in tons)* for BAD
Col 25-30	POL requirements (in tons)* for BAPD
Col 31-36	POL requirements (in tons)* for BAHD
Col 37-42	POL requirements (in tons)* for ME
Col 43-48	POL requirements (in tons)* for RAHD
Col 49-54	POL requirements (in tons)* for RAPD
Col 55-60	POL requirements (in tons)* for RAD
Col 61-66	POL requirements (in tons)* for QUIET
Col 67-72	POL requirements (in tons)* for RESERVE
Col 73-75	Sequence label
Col 76-80	Sequence number

*Per division cycle (12 hours).

CAA-D-80-3

WEAPON DESCRIPTION (Ammo Rqmts) CARD

FORMAT 2A4,10X,9F6.2,A3,I5

Col 1- 8	"WPNTYPE6"
Col 9-18	Blank
Col 19-24	Ammo requirements (in tons)* for BAD
Col 25-30	Ammo requirements (in tons)* for BAPD
Col 31-36	Ammo requirements (in tons)* for BAHD
Col 37-42	Ammo requirements (in tons)* for ME
Col 43-48	Ammo requirements (in tons)* for RAHD
Col 49-54	Ammo requirements (in tons)* for RAPD
Col 55-60	Ammo requirements (in tons)* for RAD
Col 61-66	Ammo requirements (in tons)* for QUIET
Col 67-72	Ammo requirements (in tons)* for RESERVE
Col 73-75	Sequence label
Col 76-80	Sequence number

*Per division cycle (12 hours).

WEAPON DESCRIPTION (Other Supply Rqmts) CARD

FORMAT 2A4,2X,2F4.2,9F6.2,A3,I5

Col 1- 8	"WPNTYPE7"
Col 9-10	Blank
Col 11-14	OTHER SUPPLY "P" modifier for rationing OTHER SUPPLY, if required
Col 15-18	OTHER SUPPLY "Q" modifier for rationing OTHER SUPPLY, if required
Col 19-24	OTHER SUPPLY requirement (in tons)* for BAD
Col 25-30	OTHER SUPPLY requirement (in tons)* for BAPD
Col 31-36	OTHER SUPPLY requirement (in tons)* for BAHD
Col 37-42	OTHER SUPPLY requirement (in tons)* for ME
Col 43-48	OTHER SUPPLY requirement (in tons)* for RAHD
Col 49-54	OTHER SUPPLY requirement (in tons)* for RAPD
Col 55-60	OTHER SUPPLY requirement (in tons)* for RAD
Col 61-66	OTHER SUPPLY requirement (in tons)* for QUIET
Col 67-72	OTHER SUPPLY requirement (in tons)* for RESERVE
Col 73-75	Sequence label
Col 76-80	Sequence number

*Per division cycle (12 hours).

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DESTROYED WEAPONS CARD

FORMAT 2A4,2X,6F10.0,2X,A3,I5

Col 1- 8	DESTROYD
Col 9-10	Blank
Col 11-20	Fraction of the weapons hit by tanks which are totally destroyed
Col 21-30	Fraction of the weapons hit by light armor which are totally destroyed
Col 31-40	Fraction of the weapons hit by soft shooters which are totally destroyed
Col 41-50	Fraction of the weapons hit by helicopters which are totally destroyed
Col 51-60	Fraction of the weapons hit by artillery which are totally destroyed
Col 61-70	Fraction of the weapons hit by CAS which are totally destroyed
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

MANEUVER BN TYPE DEFINITION CARD

(Antitank Firepower)

FORMAT

2A4,2X,F5.0,7F6.2,15X,A3,I5

Col 1- 8	"MNBNTYPE"
Col 9-10	Blank
Col 11-15	Quantity of personnel (not weapon crews) assigned to this type bn
Col 16-21	Antitank (AT) firepower for BAD from personnel
Col 22-27	Antitank (AT) firepower for BAPD from personnel
Col 28-33	Antitank (AT) firepower for BAHD from personnel
Col 34-39	Antitank (AT) firepower for ME from personnel
Col 40-45	Antitank (AT) firepower for RAHD from personnel
Col 46-51	Antitank (AT) firepower for RAPD from personnel
Col 52-57	Antitank (AT) firepower for RAD from personnel
Col 58-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: Above IFP values are per division cycle.

This card and the next nine cards define a maneuver bn type. A 10-card deck must be submitted for each maneuver bn type required.

MANEUVER BN TYPE DEFINITION CARD

(ALA Firepower)

FORMAT 2A4,2X,F5.0,7F6.2, 15X,A3,I5

Col 1- 8	"MNBNTYP1"
Col 9-10	Blank
Col 11-15	Personnel shortage factor "Q" (full effective- ness fraction for AT/M wpns)*
Col 16-21	Antilight armor (ALA) firepower for BAD from personnel
Col 22-27	Antilight armor (ALA) firepower for BAPD from personnel
Col 28-33	Antilight armor (ALA) firepower for BAHD from personnel
Col 34-39	Antilight armor (ALA) firepower for ME from personnel
Col 40-45	Antilight armor (ALA) firepower for RAHD from personnel
Col 46-51	Antilight armor (ALA) firepower for RAPD from personnel
Col 52-57	Antilight armor (ALA) firepower for RAD from personnel
Col 58-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Should a shortage of personnel exist within the noncrew personnel pool of the maneuver unit status file, a constraint on AT/M firepower is applied as described in GRC paper, "Personnel Shortage Effects Improvement to CEM IV," R. W. Parker, Jr., 20 Nov 74.

Note: Above IFP values are per division cycle.

MANEUVER BN TYPE DEFINITION CARD

(Antipersonnel Firepower)

FORMAT 2A4,2X,F5.0,7F6.2,15X,A3,I5

Col 1- 8	"MNBNTYP2"
Col 9-10	Blank
Col 11-15	Personnel shortage factor "R" (zero effective- ness fraction for AT/M wpns)*
Col 16-21	Antipersonnel (AP) firepower for BAD from per- sonnel
Col 22-27	Antipersonnel (AP) firepower for BAPD from per- sonnel
Col 28-33	Antipersonnel (AP) firepower for BAHD from per- sonnel
Col 34-39	Antipersonnel (AP) firepower for ME from per- sonnel
Col 40-45	Antipersonnel (AP) firepower for RAHD from per- sonnel
Col 46-51	Antipersonnel (AP) firepower for RAPD from per- sonnel
Col 52-57	Antipersonnel (AP) firepower for RAD from per- sonnel
Col 58-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*See MNBNTYP1 card for explanation.

Note: Above IFP values are per division cycle.

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MANEUVER BN TYPE DEFINITION CARD

(POL on Hand and Consumption by Personnel)

FORMAT 2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"MNBNTYP3"
Col 9-10	Blank
Col 11-16	Tons of POL on hand for this maneuver bn type for total bn use
Col 17-22	Tons of POL requirement for BAD per division cycle*
Col 23-28	Tons of POL requirement for BAPD per division cycle*
Col 29-34	Tons of POL requirement for BAHD per division cycle*
Col 35-40	Tons of POL requirement for ME per division cycle*
Col 41-46	Tons of POL requirement for RAHD per division cycle*
Col 47-52	Tons of POL requirement for RAPD per division cycle*
Col 53-58	Tons of POL requirement for RAD per division cycle*
Col 59-64	Tons of POL requirement for QUIET per division cycle*
Col 65-70	Tons of POL requirement for RESERVE per divi- sion cycle*
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

*Total bn requirement except for weapons defined on WPNTYPE5 cards. The CEM preprocessor divides this figure by personnel on MNBNTYPE card to arrive at POL requirement/man for brigade consumption calculations.

MANEUVER BN TYPE DEFINITION CARD

(AMMO on Hand and Consumption by Personnel)

FORMAT 2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"MNBNTYP4"
Col 9-10	Blank
Col 11-16	Tons of AMMO on hand for this maneuver bn type
Col 17-22	Tons of AMMO requirement for BAD per division cycle*
Col 23-28	Tons of AMMO requirement for BAPD per division cycle*
Col 29-34	Tons of AMMO requirement for BAHD per division cycle*
Col 35-40	Tons of AMMO requirement for ME per division cycle*
Col 41-46	Tons of AMMO requirement for RAHD per division cycle*
Col 47-52	Tons of AMMO requirement for RAPD per division cycle*
Col 53-58	Tons of AMMO requirement for RAD per division cycle*
Col 59-64	Tons of AMMO requirement for QUIET per division cycle*
Col 65-70	Tons of AMMO requirement for RESERVE per division cycle
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

*Total bn requirement except for weapons defined on WPNTYPE6 cards. The CEM preprocessor divides this figure by personnel on MNBNTYPE card at AMMO requirement/man for bde consumption calculations.

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MANEUVER BN TYPE DEFINITION CARD

(OTHER SUPPLIES on Hand and Consumption by Personnel)

FORMAT 2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"MNBNTYP5"
Col 9-10	Blank
Col 11-16	Tons of OTHER SUPPLIES on hand for this maneuver bn type
Col 17-22	Tons of OTHER SUPPLIES requirement for BAD per division cycle*
Col 23-28	Tons of OTHER SUPPLIES requirement for BAPD per division cycle*
Col 29-34	Tons of OTHER SUPPLIES requirement for BAHD per division cycle*
Col 35-40	Tons of OTHER SUPPLIES requirement for ME per division cycle*
Col 41-46	Tons of OTHER SUPPLIES requirement for RAHD per division cycle*
Col 47-52	Tons of OTHER SUPPLIES requirement for RAPD per division cycle*
Col 53-58	Tons of OTHER SUPPLIES requirement for RAD per division cycle*
Col 59-64	Tons of OTHER SUPPLIES requirement for QUIET per division cycle*
Col 65-70	Tons of OTHER SUPPLIES requirement for RESERVE per division cycle*
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

*Total bn requirement except for weapons defined on WPNTYPE7 cards. The CEM preprocessor divides this figure by personnel on MNBNTYPE card at OTHER SUPPLY requirement/man for bde consumption calculations.

MANEUVER BN TYPE DEFINITION CARD

(TANKS Assigned to Bn)

FORMAT 2A4,12(2X,F3.0)4X,A3,I5

Col 1- 8	"MNBNTYP6"
Col 9-10	Blank
Col 11-13	Quantity of type 1 tanks
Col 14-15	Blank
Col 16-18	Quantity of type 2 tanks
Col 19-20	Blank
Col 21-23	Quantity of type 3 tanks
Col 24-25	Blank
Col 26-28	Quantity of type 4 tanks

This cycle (2 columns blank followed by 3 columns for quantity of tank) continues through card column 66-68 which is quantity of type 12 tanks. Previous to this, the user must have specified data entries in weapon description for each weapon specified in a maneuver bn.

Col 69-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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MANEUVER BN TYPE DEFINITION CARD

(LIGHT ARMOR Assigned to Bn)

FORMAT 2A4,12(2X,F3.0),4X,A3,I5

Col 1- 8	"MNBNTYP7"
Col 9-10	Blank
Col 11-13	Quantity of type 1 light armor
Col 14-15	Blank
Col 16-18	Quantity of type 2 light armor
Col 19-20	Blank
Col 21-23	Quantity of type 3 light armor
Col 24-25	Blank
Col 26-28	Quantity of type 4 light armor

This cycle (2 columns blank followed by 3 columns for quantity of light armor weapons) continues through card column 66-68 which is quantity of type 12 light armor assigned to this bn.

Col 69-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: Previously, the user must have specified data entries in weapon description for each weapon type specified in a maneuver bn.

MANEUVER BN TYPE DEFINITION CARD

(HELICOPTERS Assigned to Bn)

FORMAT 2A4,12(2X,F3.0),4X,A3,15

Col 1- 8	"MNBNTYPE8"
Col 9-10	Blank
Col 11-13	Quantity of type 1 Blue helicopters*
Col 14-15	Blank
Col 16-18	Quantity of type 2 Blue helicopters
Col 19-20	Blank
Col 21-23	Quantity of type 3 Blue helicopters
Col 24-25	Blank
Col 26-28	Quantity of type 4 Blue helicopters
Col 29-30	Blank
Col 31-33	Quantity of type 5 Blue helicopters
Col 34-68	Blank
Col 69-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*There is a maximum of (5) five helicopter types and a minimum of (1) one type for Blue force.

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MANEUVER BN TYPE DEFINITION CARD
(ANTITANK WEAPONS Assigned to Bn)

FORMAT 2A4,12(2X,F3.0),4X,A3,I5

Col 1- 8	"MNBNTYP9"
Col 9-10	Blank
Col 11-13	Quantity of type 1 antitank/mortar weapons
Col 14-15	Blank
Col 16-18	Quantity of type 2 antitank/mortar weapons

This cycle (2 columns blank followed by 3 columns for quantity of antitank/mortars) continues through card Column 66-68 which is quantity of type 12 antitank/mortar weapons assigned to this bn.

Col 69-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: The user must have previously specified data in weapon description for each type specified in a maneuver bn.

MANEUVER BN INTELLIGENCE CARD

FORMAT 2A4,2X,3F5.0,47X,A3,I5

Col 1- 8	"MNBINTL"
Col 9-10	Blank
Col 11-15	The coefficient "a"
Col 16-20	The coefficient "b"
Col 21-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: See para 6-2d of Part I for explanation of these coefficients. Note the effect when the TOS switch is on (designated on "TOS Options" card in Run section). The sum of a and b is not required to be 1; however, a warning is issued if their sum is not equal to 1.0.

One card is required for each type of maneuver Bn specified on the "COUNTS" card, and the coefficients represent the capability of the enemy in detecting the presence of each particular type of battalion.

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INITIAL NONDIVISIONAL ARTILLERY COUNTS CARD

FORMAT 2A4,2X,8I5,22X,A4,I5

Col 1- 8	"INITARTY"
Col 9-10	Blank
Col 11-15	Initial count of nondivisional artillery bn of type 1
Col 16-20	Initial count of nondivisional artillery bn of type 2
Col 21-25	Initial count of nondivisional artillery bn of type 3
Col 26-30	Initial count of nondivisional artillery bn of type 4
Col 31-35	Initial count of nondivisional artillery bn of type 5
Col 36-40	Initial count of nondivisional artillery bn of type 6
Col 41-45	Initial count of nondivisional artillery bn of type 7
Col 46-50	Initial count of nondivisional artillery bn of type 8
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: This is GS artillery assigned initially to the theater (nondivisional). Divisional GS/DS artillery is assigned on the "DIVISION" card.

ARMY DESCRIPTION CARD

FORMAT 2A4,2X,2A4,2X,3I5,5X,I10,22X,A3,I5

Col 1- 8	"ARMY"
Col 9-10	Blank
Col 11-18	Army name (user assigned - up to 8 characters)
Col 19-20	Blank
Col 21-25	Low minisector boundary (frontage coordinate - north)
Col 26-30	High minisector boundary (frontage coordinate - south)
Col 31-35	Quantity of subordinate corps assigned to this army HQ ≥ 2 , ≤ 5
Col 36-50	Blank
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: The "COUNT" card has specified the quantity of armies to be defined.

CORPS DESCRIPTION CARD

FORMAT

2A4,2X,2A4, 2X,3I5,5X,I10,1X,A4,16X,I1,A3,I5

Col 1- 8	"CORPS"
Col 9-10	Blank
Col 11-18	Corps name (user assigned - 8 characters)
Col 19-20	Blank
Col 21-25	Low minisector boundary (frontage coordinate - north)
Col 26-30	High minisector boundary (frontage coordinate - south)
Col 31-35	Quantity subordinate divisions assigned to this corps*
Col 36-54	Blank
Col 55	Status of this corps: A = Active R = Reserve
Col 56-71	Optional comments
Col 72	Partition for resupply of corps cavalry (1, 2, or 3); zero or blank defaults to 1
Col 73-75	Sequence label
Col 76-80	Sequence number

*Quantity of subordinate divisions, $> 0 \leq 5$.

CORPS CAV UNIT CARD

(Blue corps only)

FORMAT	2A4,2X,15,5X,1015,2X,A3,15
Col 1- 8	"CORPHELI"
Col 9-10	Blank
Col 11-15	Initial strength
Col 16-20	Blank
Col 21-25	Maneuver bn type (as previously defined in "MNBNTYPE")
Col 26-30	Quantity of maneuver bns of type designated in Col 21-25
Col 31-35	Maneuver bn type
Col 36-40	Quantity of maneuver bns of type designated in Col 31-35
Col 41-45	Maneuver bn type
Col 46-50	Quantity of maneuver bns of type designated in Col 41-45
Col 51-55	Maneuver bn type
Col 56-60	Quantity of maneuver bns of type designated in Col 51-55
Col 61-65	Maneuver bn type
Col 66-70	Quantity of maneuver bns of type designated in Col 61-65
Col 71-72	Blank
Col 73-76	Sequence label
Col 76-80	Sequence number

Notes: There must be at least one (1) helicopter in at least one (1) of the maneuver bns assigned to this corps cav unit. If this corps does not have a cav unit, card columns 9-72 must be blank. There must always be two (2) "CORPHELI" cards, even though the second card may not contain an entry as to type and quantity of maneuver bn.

Initial strength columns 11-15 - this value divided by 100 will be multiplied by each full strength "authorized" load of personnel, POL, AMMO, other supplies and all weapons to yield the "actual" initial on hand load.

BLUE DIVISION CARD

FORMAT	2A4,2X,2A4,2X,5I5,1X,A4,4X,56.0,3I3,2X,I1,A3,I5
Col 1- 8	"DIVISION"
Col 9-10	Blank
Col 11-18	Division name
Col 19-20	Blank
Col 21-25	Low minisector boundary (frontage coordinate-north)
Col 26-30	High minisector boundary (frontage coordinate-south)
Col 31-35	Blank
Col 36-40	Type of GS artillery battalions assigned to division (Blank or zero implies no arty bn organic to the division.)
Col 41-45	Quantity of GS artillery bns assigned to division (max=5)
Col 46-49	Blank
Col 50	Status of this Blue division : A = Active R = Reserve (reinforcing division must be A)
Col 51-54	Blank
Col 55-60	Blue bde FEBA movement threshold for prepared defense or barrier** (same for each bde within division)
Col 61-63	1st brigade DS artillery battalion type (0-15)***
Col 64-66	2d brigade DS artillery battalion type (0-15)***
Col 67-69	3d brigade DS artillery battalion type (0-15)***
Col 70-71	Blank
Col 72	Partition for this unit (1, 2, or 3); zero or blank defaults to 1****
Col 73-75	Sequence label
Col 76-80	Sequence number

*Only one type battalion (1-15) of artillery can be in GS mode.

**If FEBA movement exceeds this entry the defense is considered hasty, where the FEBA movement is in hm (hectometers).

***An entry of zero for any brigade means this brigade does not have any DS arty bn assigned to it.

****Partition designation determines which resupply pool this unit will access for replenishment of personnel, Maneuver bn ammo, POL, other supplies, and arty ammo.

Note: Blue division always has three brigades.

DIVISION CAV UNIT CARD

(Blue Division only)

FORMAT

2A4,2X,15,5X,1015,2X,A3,15

Col 1- 8	"DVSNHELI"
Col 9-10	Blank
Col 11-15	Initial strength
Col 16-20	Blank
Col 21-25	Maneuver bn type (as previously defined in "MNBNTYPE")
Col 26-30	Quantity of maneuver bns of type designated in Col 21-25
Col 31-35	Maneuver bn type
Col 36-40	Quantity of maneuver bns of type designated in Col 31-35
Col 41-45	Maneuver bn type
Col 46-50	Quantity of maneuver bns of type designated in Col 41-45
Col 51-55	Maneuver bn type
Col 56-60	Quantity of maneuver bns of type designated in Col 51-55
Col 61-65	Maneuver bn type
Col 66-70	Quantity of maneuver bns of type designated in Col 61-65
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: There must be at least one (1) helicopter in at least one (1) of the maneuver bns assigned to this division's cav unit. If this division does not have a cav unit, card columns 9-72 must be blank.

BLUE BRIGADE CARD (1)

FORMAT 2A4,2X,I5,1X,A4,10I5,2X,A3,I5

Col 1- 8	"BRIGADE"
Col 9-10	Blank
Col 11-15	Initial strength
Col 16-19	Blank
Col 20	This brigade's status:
	A = Active
	R = Reserve
	G = Ghost*
Col 21-25	Low minisector boundary (frontage coordinate - north)
Col 26-30	High minisector boundary (frontage coordinate - south)
Col 31-35	Quantity type 1 maneuver bns assigned this brigade
Col 36-40	Quantity type 2 maneuver bns assigned this brigade
Col 41-45	Quantity type 3 maneuver bns assigned this brigade
Col 46-50	Quantity type 4 maneuver bns assigned this brigade
Col 51-55	Quantity type 5 maneuver bns assigned this brigade
Col 56-60	Quantity type 6 maneuver bns assigned this brigade
Col 61-65	Quantity type 7 maneuver bns assigned this brigade
Col 66-70	Quantity type 8 maneuver bns assigned this brigade
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

*In the case of a ghost bde only one "BRIGADE" card is required to define the bde, regardless of the quantity of maneuver bns previously defined on the "COUNTS" card. A ghost (G) bde is used when a division has only two "real" bdes assigned to it; this third ghost bde satisfies the requirement for three bdes per division.

Notes: If a maneuver bn of type 9-18 assigned to brigade see next card format.

All maneuver bn quantities assigned \leq 15.

If more than eight maneuver bn types are defined on the "COUNTS" card and therefore require two or more cards/brigade description, two or more brigade description cards will be required for each Blue brigade description.

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BLUE BRIGADE CARD (2)

FORMAT

2A4,12X,10I5,2X,A3,I5

Col 1- 8	"BRIGADE"
Col 9-20	Blank
Col 21-25	Quantity maneuver bn type 9
Col 26-30	Quantity maneuver bn type 10
Col 31-35	Quantity maneuver bn type 11
Col 36-40	Quantity maneuver bn type 12
Col 41-45	Quantity maneuver bn type 13
Col 46-50	Quantity maneuver bn type 14
Col 51-55	Quantity maneuver bn type 15
Col 56-60	Quantity maneuver bn type 16
Col 61-65	Quantity maneuver bn type 17
Col 66-70	Quantity maneuver bn type 18
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: This card format for types 9-18, 19-28, etc.

RED DIVISION CARD

FORMAT 2A4,2X,2A4,2X,2I5,I2,I3,4I5,1X,A4,12X,A3,I5

Col 1- 8	"DIVISION"
Col 9-10	Blank
Col 11-18	Unit name
Col 19-20	Blank
Col 21-25	Low minisector frontage coordinate
Col 26-30	High minisector frontage coordinate
Col 31-32	Red division type. The Red divisional forces are assigned type designator 1, 2, or 3.
Col 33-35	DS arty bns type 1 through 15.
Col 36-40	Quantity of DS arty bns (max = 5).
Col 41-45	GS arty bns type 1 through 15.
Col 46-50	Quantity of GS arty bns (max = 5)
Col 51-55	Initial strength, percent
Col 56-59	Blank
Col 60	Initial status
	A = Active
	R = Reserve
Col 61-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

RED REGIMENT CARD

FORMAT 2A4,12X,50I1,2X,A3,I5

Col 1- 8	"DIVISION"
Col 9-20	Blank
Col 21	Quantity of type 1 regt assigned to division (previous card).
Col 22	Quantity of type 2 regt assigned to division (previous card).
Col 23	Quantity of type 3 regt assigned to division (previous card).
Col 24	Quantity of type 4 regt assigned to division (previous card).
Col 25	Quantity of type 5 regt assigned to division (previous card).
Col 26	Quantity of type 6 regt assigned to division (previous card).
Col 27	Quantity of type 7 regt assigned to division (previous card).
Col 28	Quantity of type 8 regt assigned to division (previous card).
Col 29	Quantity of type 9 regt assigned to division (previous card).
Col 30	Quantity of type 10 regt assigned to division (previous card).

Etc. to Col 70 = Quantity of type 50 regt

Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: Maximum quantity of each type of regiment is nine.

REINFORCING DIVISION(S) ARRIVAL CARD

FORMAT

2A4,2X,16I2,30X,A3,I5

Col 1- 8	"ARRVDVSN"
Col 9-10	Blank
Col 11-12	Theater cycle in which the reinforcing divisions will arrive in the theater.
Col 13-14	Blank
Col 15-16	Army headquarters* to which the reinforcing division(s) will be assigned. (Army cycle** 1)
Col 17-18	The quantity of reinforcing division(s) to be assigned, max = 31. (Army cycle** 1)
Col 19-20	Army headquarters* to which the reinforcing division(s) will be assigned. (Army cycle** 2)
Col 21-22	The quantity of reinforcing division(s) to be assigned, max = 31. (Army cycle** 2)
Col 23-24	Army headquarters* to which the reinforcing division(s) will be assigned. (Army cycle** 3)
Col 25-26	The quantity of reinforcing division(s) to be assigned, max = 31. (Army cycle** 3)
Col 27-28	Army headquarters* to which the reinforcing division(s) will be assigned. (Army cycle** 4)
Col 29-30	The quantity of reinforcing division(s) to be assigned, max = 31. (Army cycle** 4)
Col 31-32	Army headquarters* to which the reinforcing division(s) will be assigned. (Army cycle** 5)
Col 33-34	The quantity of reinforcing division(s) to be assigned, max = 31. (Army cycle** 5)
Col 35-36	Army headquarters* to which the reinforcing division(s) will be assigned. (Army cycle** 6)
Col 37-38	The quantity of reinforcing division(s) to be assigned, max = 31. (Army cycle** 6)
Col 39-40	Army headquarters* to which the reinforcing division(s) will be assigned. (Army cycle** 7)
Col 41-42	The quantity of reinforcing division(s) to be assigned, max = 31. (Army cycle** 7)
Col 43-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Where the army headquarters to which the reinforcing division(s) are assigned is:

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a. An entry of zero (0) permits the model to assign said divisions to the "optimal" army headquarters.

b. An entry (integer) one (1) through N, where N is less than or equal to the number of armies which have been defined in the game when this division arrives (includes model created armies), i.e., the first army defined, by force, is = 1, the second = 2, etc.

**The user has previously specified the number of army cycles per theater cycle; therefore, an entry may not be made in a data field for an army cycle greater than the army cycles per theater cycle.

Notes: The "COUNTS" card, Cols 26-30, has specified the quantity of "ARRVDVSN" cards to be input. The total count of all arriving divisions may not exceed the count previously specified on the "COUNTS" card, Cols 21-25. Maximum of fifty (50) "ARRVDVSN" cards per force (Red or Blue).

If only one army HQ exists, the assigned HQ is assumed to be to the corps HQ, not the army HQ.

ARTILLERY ARRIVAL SCHEDULE CARD

FORMAT	2A4,2X,15,5X,815,12X,A3,15
Col 1- 8	"ARRVARTY"
Col 9-10	Blank
Col 11-15	Theater cycle during which these nondivisional GS arty bns are to arrive, ≥ 2 , \leq quantity of theater cycles for the game.
Col 16-20	Blank
Col 21-25	Quantity of type 1 nondivisional GS arty bns arriving in theater
Col 26-30	Quantity of type 2 nondivisional GS arty bns arriving in theater
Col 31-35	Quantity of type 3 nondivisional GS arty bns arriving in theater
Col 36-40	Quantity of type 4 nondivisional GS arty bns arriving in theater
Col 41-45	Quantity of type 5 nondivisional GS arty bns arriving in theater
Col 46-50	Quantity of type 6 nondivisional GS arty bns arriving in theater
Col 51-55	Quantity of type 7 nondivisional GS arty bns arriving in theater
Col 56-60	Quantity of type 8 nondivisional GS arty bns arriving in theater
Col 61-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: Maximum of fifty (50) cards.

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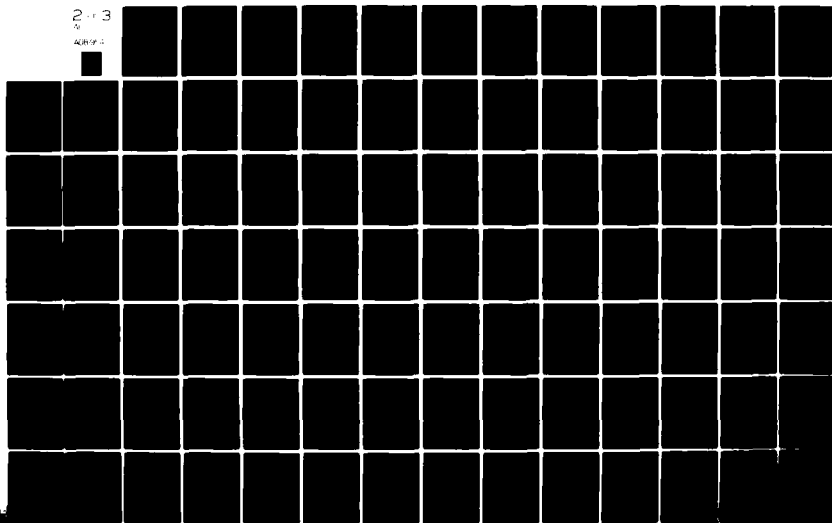
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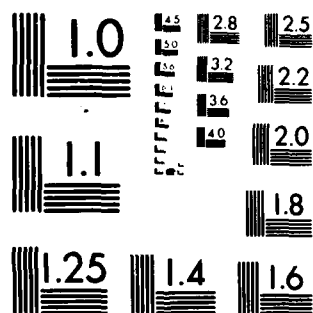
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963 A

LOGISTICAL ARRIVAL CARD

FORMAT 2A4,2X,I2,5(1X,I1,1X,I2,1X,F5.0),5X,A3,I5

Col 1- 8	"LOGISTIC"
Col 9-10	Blank
Col 11-12	Theater cycle in which this logistic load arrives in theater
Col 13	Blank
Col 14	Major item category*
Col 15	Blank
Col 16-17	If Col 14 (major item category) is a weapon, specify weapon type 1-12, except helicopters 1-5, and artillery tubes 1-8. If Col 14 is a supply item (5-9), specify partition 1-3 (Blank defaults to 1).
Col 18	Blank
Col 19-23	Quantity of resupply items specified in Cols 14 and 16-17, per theater cycle (4 days). Field definition 13-23 repeated four more times on each card as fields 24-34, 35-45, 46-56, and 57-67.
Col 68-72	Optional comments
Col 73-75	sequence label
Col 76-80	Sequence number

*Major item category: 1 = TANKS, 2 = LIGHT ARMOR, 3 = HELICOPTERS, 4 = ANTITANK and MORTARS, 5 = POL, 6 = AMMO, 7 = OTHER SUPPLIES, 8 = PERSONNEL, 9 = ARTY AMMO, 0 = ARTY TUBES.

Notes: Major item category 5 (POL), 6 (AMMO), 7 (OTHER SUPPLIES), 8 (PERSONNEL), and 9 (ARTY AMMO) are input in units of 1,000. Input dimensions are: supplies in tons, personnel in men, and equipment in items.

Major item categories 0-4 input as integers only, as this is the manner in which they are handled in packing routines.

Maximum input for all items for theater cycle zero (0) is 99,999. Major item categories 0-4 are limited to 2,047 maximum input for all other cycles.

MAINTENANCE CAPACITY CARD

FORMAT

2A4,2X,12,2X,9I6,4X,A3,15

Col 1- 8	"ARRMAINT"
Col 9-10	Blank
Col 11-12	Theater cycle
Col 13-14	Blank
Col 15-20	Maximum number of tanks that may enter partition 1 tank repair facilities in one theater cycle
Col 21-26	Maximum number of APC that may enter partition 1 APC repair facilities in one theater cycle
Col 27-32	Maximum number of helicopters that may enter partition 1 helicopter facilities in one theater cycle
Col 33-38	Same as 15-20, for partition 2
Col 39-44	Same as 21-26, for partition 2
Col 45-50	Same as 27-32, for partition 2
Col 51-56	Same as 15-20, for partition 3
Col 57-62	Same as 21-26, for partition 3
Col 63-70	Same as 27-32, for partition 3
Col 71-74	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: Columns 33-70 are not used on the Red side, which has no national partitions.

UNIT SECTION ERROR
MESSAGES/DIAGNOSTICS

*** ILLEGAL UNIT STATUS"

Unit currently being processed is neither ACTIVE = A, or RESERVE = R.

***ILLEGAL MISSION ENTRY"

Starting mission for side currently being processed is neither DELAY, DEFEND, or ATTACK.

***NUMBER OF ARMIES EXCEEDS MAXIMUM"

The Blue force may not have more than six (6) armies, the Red force may not exceed twelve (12).

***ERROR IN ARMY MINISECTOR BOUNDARIES"

This message is generated when either the:

1. Entire theater frontage is not covered.
2. The army's high minisector coordinate is less than or equal to its low minisector coordinate.
3. The Army's low minisector coordinate is less than or equal to zero (0).
4. Two adjacent armies overlap on frontage. (Note: two adjacent armies may not have the same minisector coordinate.)

***NUMBER OF CORPS IN ARMY OUT OF RANGE"

A maximum of five (5) corps/army is permitted. This message is generated when the count of corps for this army is less than or equal to zero (0) or greater than five (5).

***CORPS BOUNDARIES OVERLAP ARMY BOUNDARIES"

The subordinate corps may not have frontage outside that assigned the corps' army.

***CORPS BOUNDARIES ARE SCREWED UP"

The high minisector coordinate is greater than or equal to the low minisector coordinate.

******MORE THAN ONE RESERVE CORPS IN ARMY"**

Maximum of one (1) reserve unit to each echelon of command.

******NUMBER OF DIVISIONS IN CORPS OUT OF RANGE"**

Maximum of five (5) divisions/corps. The value specified on the "CORPS" cards is either less than or equal to zero (0) or greater than five (5).

******THEATER CYCLE OUT OF RANGE"**

The theater cycle specified for the arrival of:

1. Reinforcing division(s)
2. Reinforcing artillery
3. Resource units

is greater than that specified on the "RUNLIMIT" card, Cols 11-15.

******NUMBER OF ARTILLERY ENTRIES EXCEEDS MAXIMUM"**

Maximum of fifty (50) "ARRVARTY" cards may be specified.

******NUMBER OF RESOURCE ENTRIES EXCEEDS MAXIMUM"**

Maximum of fifty (50) "LOGISTIC" cards may be specified.

******NUMBER OF REINFORCING DIVISION ENTRIES EXCEEDS MAXIMUM"**

Maximum of fifty (50) "ARRVDVSN" cards may be entered.

******NUMBER OF REINFORCING DIVISIONS SCHEDULED NOT EQUAL TO NUMBER SPECIFIED ON COUNT CARD"**

Check "COUNTS" card Cols 21-25, this number must equal total sum of numbers on all "ARRVDVSN" cards Cols 17-18, 21-22, 25-26, 29-30, 33-34, 37-38, 41-42.

******CARD NOT IN ASCENDING CYCLE ORDER"**

Card decks for "ARRVDVSN," "ARRVARTY," and "LOGISTIC" must have theater cycles, Cols 11-15, in ascending sequence.

******TOO MANY REINFORCING DIVISIONS FOR ONE ARMY CYCLE"**

A maximum of thirty-one (31) reinforcing divisions may arrive during any one army cycle.

******NUMBER OF BN TYPES OUT OF RANGE"**

A maximum of eight (8) artillery types is permitted. (Note: this value must be greater than or equal to one (1).)

*****ZERO CONVERSION FACTOR"**

The artillery conversion coefficient (factor) for one of the specified artillery types is less than or equal to zero (0), i.e., if four (4) types of artillery are specified on the "ARTYTYPE" card then there must exist four positive nonzero values in Cols 21-25, 26-30, 31-35, 36-40 of this card.

*****ZERO EXPENDITURE RATE ENTRY"**

Either the artillery direct support (DS) or general support (GS) expenditure rate for one of the artillery type bns is less than or equal to zero (0). There must exist a positive nonzero value for the two mission modes, for each of the specified artillery types.

*****MANEUVER BN TYPE COUNT OUT OF RANGE"**

The count of maneuver bn types specified on the "COUNTS" card, Cols 11-15, is either less than or equal to zero (0), or greater than fifty (50).

*****NEGATIVE VALUE NOT PERMITTED"**

Either:

1. The notional artillery firepower scores for type one (1) artillery antitank (AT), antilight armor (ALA), or antipersonnel (AP) are negative. All values specified must be positive.

Or:

2. The maneuver unit type firepower score(s) is negative. All values specified must be positive.

*****WARNING - INTELLIGENCE COEFFICIENTS SUM NOT EQUAL TO ONE"**

This does not terminate run, it only warns the user that the coefficients for the artillery sums to other than 100 percent.

*****MINISECTOR XXXXX NOT COMPLETELY COVERED"**

*****TOTAL MINISECTOR COVERAGE ERRORS = XXXXX"**

Check theater coverage by army level echelon. The entire theater frontage must be covered.

*****MINISECTOR XXXXX OVER-COVERED"**

*****TOTAL MINISECTOR COVERAGE ERRORS = XXXXX"**

Two adjacent armies are covering the same frontage. Armies may not share frontage.

*****NUMBER OF BLUE/RED DIVISIONS EXCEEDS MAXIMUM**

The maximum numbers of Blue and Red divisions are 70 and 125, respectively.

*****MORE THAN ONE RESERVE DIVISION IN THIS CORPS**

Each echelon of command may have a maximum of one reserve unit of the next lower echelon.

*****DIVISION BOUNDARIES OVERLAP CORPS**

A division's boundaries may not extend beyond those of its next higher headquarters (corps).

*****DIVISION BOUNDARIES SCREWED UP**

The high minisector boundary is less than the low minisector boundary.

*****DIVISION TYPE OUT OF RANGE**

The Red division type specified is either less than or equal to zero (0) or greater than three (3).

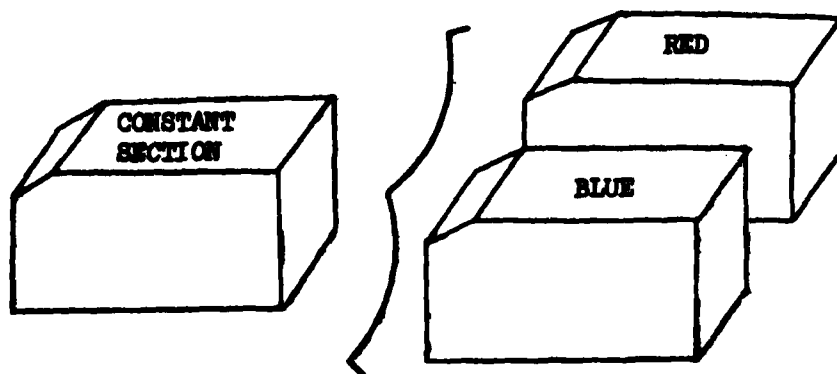
*****DIVISIONAL GS ARTY TYPE OUT OF RANGE**

The GS artillery type specified, Cols 41-45, on the "DIVISION" card is either less than or equal to zero (0) or greater than the types specified on the "ARTYTYPE" card, Cols 21-55.

*****DIVISION FRONTAGE LESS THAN SPECIFIED MINIMUM**

The difference between the high and low minisector coordinates for this division is less than minimum specified on the "MINISCTR" card, Cols 26-30.

CONSTANT SECTION



The Constant Section defines the factors used to control missions, performance, and degradation of the forces. Formats and descriptions included are as follows:

Blue Constant Input Data Structure, Figure 1-4

Red Constant Input Data Structure, Figure 1-5

Sample Constants Input Data Card Listing

Constant Section Card

Theater Resource Delay Card

Army Resource and Unit Delay Card

Army Mission Threshold (Force Ratio) Card

Army Intelligence Card

Corps Resource and Unit Delay Card

Corps Mission Threshold (Force Ratio) Card

Corps Intelligence Card

Division Mission Threshold Card

Fatigue Factor Card

Artillery Increased Firepower Card

Personnel Assimilation Fraction Card

Personnel Logistic Support Card

Equipment Logistic Support Cards

Personnel Casualties Factor Card

Personnel KIA, WIA Factor Cards

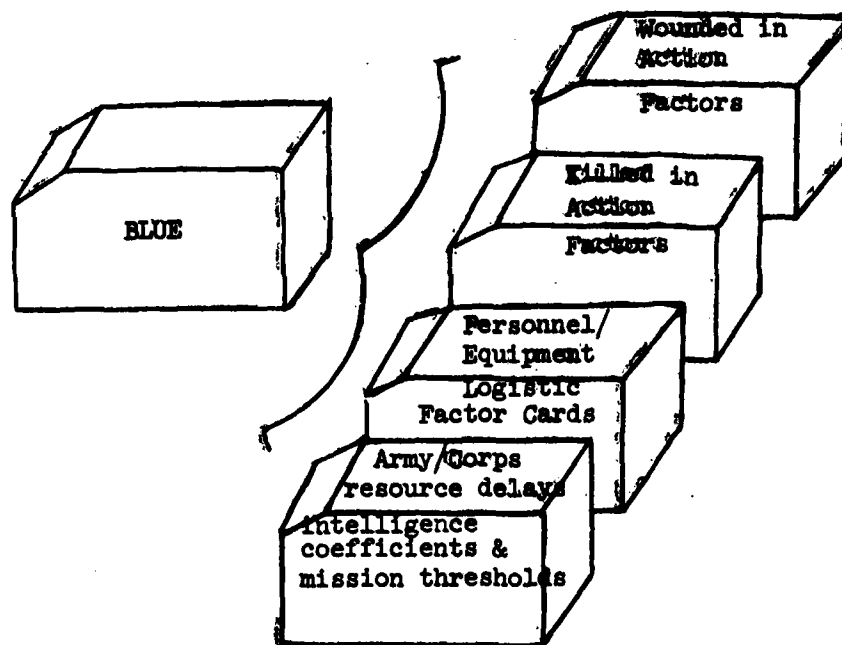


Figure 1-4. Blue Constant Input Data Structure

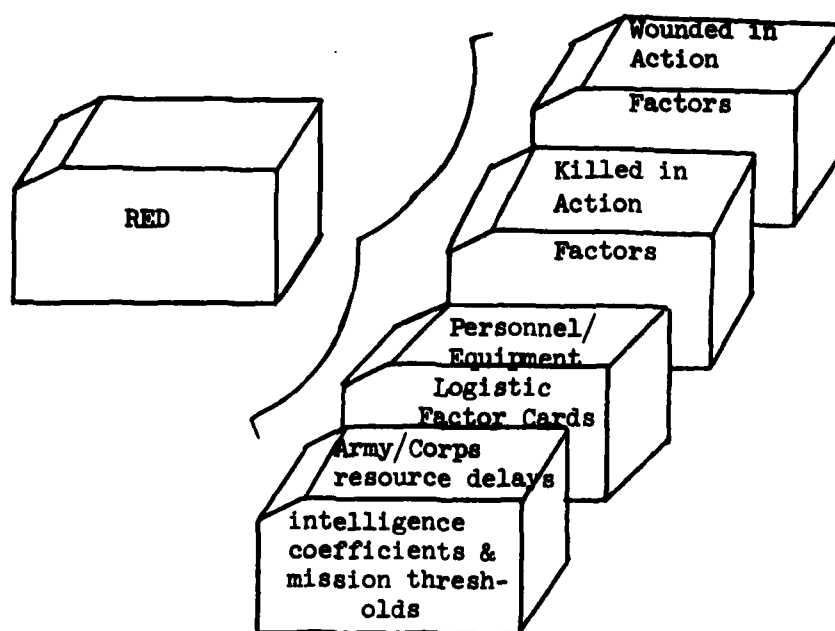


Figure 1-5. Red Constant Input Data Structure

()

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CONSTANT SECTION CARD

FORMAT 2A4,2X,2A4,2X,2A4,2X,I5,37X,A3,I5

Col 1- 8	"SECTION"
Col 9-10	Blank
Col 11-18	"CONSTANT"
Col 19-20	Blank
Col 21-28	"SEQCOMNT" ignore out-of-sequence cards, but comment
	"SEQABORT" abort if cards out of sequence
	"SEQIGNOR" ignore out-of-sequence cards
Col 29-30	Blank
Col 31-35	Logical input unit for this section of data
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

THEATER RESOURCE DELAY CARD

FORMAT

2A4,2X,8I5,22X,A3,I5

Col 1- 8	"TCDELAYS"
Col 9-10	Blank
Col 11-15	Time (theater cycles) delay for POL w/friendly air environment to reach front line units.
Col 16-20	Time (theater cycles) delay for POL wo/friendly air environment to reach front line units.
Col 21-25	Time (theater cycles) delay for AMMO w/friendly air environment to reach front line units.
Col 26-30	Time (theater cycles) delay for AMMO wo/friendly air environment to reach front line units.
Col 31-35	Time (theater cycles) delay for OTHER SUPPLIES w/friendly air environment to reach front line units.
Col 36-40	Time (theater cycles) delay for OTHER SUPPLIES wo/friendly air environment to reach front line units.
Col 41-50	Blank
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: A value of 1 results in these supplies being delivered to the units during the upcoming theater period. A value of 2 results in one theater period delay, etc. (The values must not be zero.) Maximum allowable delay is 20 theater cycles.

ARMY RESERVE UNIT DELAY CARD

FORMAT

2A4,2X,4I5,42X,A3,I5

Col 1- 8	"ACDELAYS"
Col 9-20	Blank
Col 21-25	Army reserve corps commitment delay, in corps cycles, <u>without</u> friendly air environment
Col 26-30	Army reserve corps commitment delay, in corps cycles, <u>with</u> friendly air environment
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: A value of zero results in no delay. A value of 1 results in one corps cycle delay, etc. Maximum allowable delay is 6 corps cycles.

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ARMY MISSION THRESHOLD (Force Ratio) CARD

FORMAT

2A4,2X,5F5.0,I5,32X,A3,I5

Col 1- 8	"ACTHRESH"
Col 9-10	Blank
Col 11-15	Attack mission (< defend)*
Col 16-20	Attack with reserve (< commit reserve, > reconstitute reserve)*
Col 21-25	Defend mission (< delay)*
Col 26-30	Defend with reserve (< commit reserve, > reconstitute reserve)*
Col 31-35	Delay with reserve (< commit reserve, > reconstitute reserve)*
Col 36-40	Maximum distance in minisectors an army can shift a corps boundary during boundary adjustment in defense.**
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*See para 3-4 of Part I for explanation of the use of these thresholds.

**See para 3-5 of Part I for explanation of this factor.

ARMY INTELLIGENCE CARD

FORMAT	2A4,2X,3F5.0,47X,A3,I5
Col 1- 8	"ACINTELL"
Col 9-10	Blank
Col 11-15	"a" weighting coefficient for last army cycle (n)
Col 16-20	"e" if TOS yes "b" weighting coefficient for army cycle (n-1) "f" if TOS yes
Col 21-25	"c" weighting coefficient to extrapolate trend
Col 26-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: See para 6-2d of Part I for explanation of the algorithm using these coefficients.

CAA-D-80-3

CORPS RESERVE AND UNIT DELAY CARD

FORMAT 2A4,2X,4I5,42X,A3,I5

Col 1- 8	"CCDELAYS"
Col 9-20	Blank
Col 21-25	Corps reserve division commitment delay, in division cycles, <u>without</u> friendly air environment
Col 26-30	Corps reserve <u>division</u> commitment delay, in division cycles, <u>with</u> friendly air environment
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: A value of zero results in no delay. A value of 1 results in a delay of one division cycle, etc. Maximum allowable delay is 6 division cycles.

CORPS MISSION THRESHOLD (Force Ratio) CARD

FORMAT	2A4,2X,5F5.0,I5,32X,A3,I5
Col 1- 8	"CCTHRESH"
Col 9-10	Blank
Col 11-15	Attack mission (< defend)*
Col 16-20	Attack with reserve (< commit reserve, > reconstitute reserve)*
Col 21-25	Defend mission (< delay)*
Col 26-30	Defend with reserve (< commit reserve, > reconstitute reserve)*
Col 31-35	Delay with reserve (< commit reserve, > reconstitute reserve)*
Col 36-40	Maximum distance in minisectors that a corps can shift a division's boundary during boundary adjustment in defense.**
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*See para 4-4 of Part I for explanation of the use of these thresholds.

**See para 4-5 of Part I for explanation of this factor.

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CORPS INTELLIGENCE CARD

FORMAT

2A4,2X,3F5.0,47X,A3,I5

Col 1- 8	"CCINTELL"
Col 9-10	Blank
Col 11-15	"a" weighting coefficient for last corps/cycle
	"e" if TOS yes
Col 16-20	"b" weighting coefficient for next to last corps cycle
	"f" if TOS yes
Col 21-25	"c" weighting coefficient to extrapolate trend
Col 26-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: These intelligence coefficients apply for this corps
looking at enemy corps.

See para 6-2d of Part I for explanation of the algo-
rithm using these coefficients.

DIVISION MISSION THRESHOLD CARD

FORMAT	2A4,2X,5F5.0,4I5,17X,A3,I5
Col 1- 8	"DCTHRESH"
Col 9-10	Blank
Col 11-15	Attack threshold, if average state of all subordinate units \geq , division may attack*
Col 16-20	Defend threshold, if average state $<$ attack \geq to this entry, division may defend. If $<$ this entry, division must delay*
Col 21-25	Not used
Col 26-30	Intelligence coefficient for estimating opponent's status during division cycle n-1 (Blue w/TOS for current division cycle n)**
Col 31-35	Intelligence coefficient for estimating opponent's status during division cycle n-2 (Blue w/TOS for division cycle n-1)**
Col 36-40	Not used
Col 41-45	First theater cycle for alternate attack threshold
Col 46-50	Last theater cycle for alternate attack threshold
Col 51-55	Alternate attack threshold*
Col 56-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Threshold may exceed 100. See para 1-9 of Part I for explanation of brigade state and these thresholds.

**See para 6-2d of Part I for explanation of the use of these coefficients.

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RESERVE BRIGADE STATE DIFFERENTIAL CARD

FORMAT 2A4,2X,2I5,52X,A3,I5

Col 1- 8	"FATIGUE"
Col 9-15	Blank
Col 16-20	State differential threshold for determining exchange of weak on-line brigade for strong re- serve brigade.
Col 21-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: Value applies to Blue side only but card is required for
each side.

ARTILLERY INCREASED FIREPOWER CARD

FORMAT	2A4,2X,3F5.0,4X,11,2F10.0,22X,A3,I5
Col 1- 8	"ARTYRATE"
Col 9-15	Blank
Col 16-20	Fraction of GS artillery a division may convert to DS.*
Col 21-29	Blank
Col 30	Red side (2) only; 1 = all DS and GS artillery organic to a reserve division will be assigned to take under fire any opposing enemy reserve units; 0 = all DS and GS artillery organic to a reserve division will be held in reserve with division.
Col 31-50	Blank
Col 51-72	Optional comments.
Col 73-75	Sequence label
Col 76-80	Sequence number

*Blue may not exceed .33, as entry is for each Blue brigade.

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PERSONNEL ASSIMILATION FRACTION CARD

FORMAT 2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"RESASSIM"
Col 9-10	Blank
Col 11-16	Fraction of personnel assimilated during division cycle i
Col 16-22	Same for cycle i+1
Col 23-28	Same for cycle i+2
Col 29-34	Same for cycle i+3
Col 35-40	Same for cycle i+4
Col 41-46	Same for cycle i+5
Col 47-52	Same for cycle i+6
Col 53-58	Same for cycle i+7
Col 59-64	Same for cycle i+8
Col 65-70	Same for cycle i+9
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

LOGISTIC SUPPORT (Personnel) CARD

FORMAT	2A4,2X,10F5.0,12X,A3,I5
Col 1- 8	"PERSTYPE"
Col 9-10	Blank
Col 11-15	Time (theater cycles) personnel sent to hospital must remain before recommitment to front. (Zero entry will return personnel in next theater cycle.)
Col 16-20	Time (theater cycles) delay encountered by replacement (new arrivals in theater from ports and hospitals) personnel to reach front lines. (May not be zero or blank.)
Col 21-25	Fraction of total DNBI that are killed.
Col 26-30	Fraction of WIA requiring hospitalization.
Col 31-35	Fraction of surviving DNBI requiring hospitalization.
Col 36-40	Nonbattle losses per 100 men.
Col 41-45	Fraction of WIA sent to theater hospital
Col 46-50	Fraction of DNBI sent to theater hospital
Col 51-60	Blank
Col 61-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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LOGISTIC SUPPORT (Equipment) CARD(S)*

FORMAT 2A4,2X,5F5.0,37X,A3,I5

Col 1- 8	"EQIPTYPE"
Col 9-10	Blank
Col 11-15	Time (theater cycles) to repair one weapon of this major item category.* (Zero will return weapon in next theater cycle.)
Col 16-20	Friendly air environment weapon replacement delay time (theater cycles). (Entry may not be zero or blank.)
Col 21-25	Enemy air environment weapon replacement delay time (theater cycles). (Entry may not be zero or blank.)
Col 26-30	Coefficient of repairable damaged weapons abandoned per hectometer of FEBA lost to enemy**
Col 31-35	Blank
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Cards - 1=TANKS, 2=LIGHT ARMOR, 3=HELICOPTERS. (Antitank/mortars have same replacement delays as TANKS.)

**Abandoned = Repairable $\cdot [1 - \exp(\text{coefficient} \cdot \text{neg FEBA movement})]$

Notes: This card required for a major weapon category only if the force contains weapons in the respective category.

See para 2-2 and 5-4a of Part I for discussion of maintenance support.

SUPPLY ABSORPTION LIMIT CARD

FORMAT	2A4,2X,10F5.0,12X,A3,I5
Col 1- 8	"LOGLIMIT"
Col 9-10	Blank
Col 11-15	Maximum division cycle absorption of TANK shortage
Col 16-20	Maximum division cycle absorption of APC shortage
Col 21-25	Maximum division cycle absorption of HELI shortage
Col 26-30	Maximum division cycle absorption of AT/M shortage
Col 31-35	Maximum division cycle absorption of POL shortage
Col 36-40	Maximum division cycle absorption of AMMO shortage
Col 41-45	Maximum division cycle absorption of OTHER shortage
Col 46-50	Maximum division cycle absorption of PERSONNEL shortage
Col 51-55	Maximum division cycle absorption of ARTY AMMO shortage
Col 56-60	Maximum division cycle absorption of ARTY TUBES shortage
Col 61-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: Above input values are fractions ranging from 0.00 to 1.00.

Cards required for Blue and Red--follows third EQUIPTYPE card.

PERSONNEL CASUALTIES FACTOR CARD

FORMAT 2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"PERSCASL"
Col 9-10	Blank
Col 11-16	Personnel casualties factor for BAD
Col 17-22	Personnel casualties factor for BAPD
Col 23-28	Personnel casualties factor for BAHD
Col 29-34	Personnel casualties factor for ME
Col 35-40	Personnel casualties factor for RAHD
Col 41-46	Personnel casualties factor for RAPD
Col 47-52	Personnel casualties factor for RAD
Col 53-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: This factor (k) is the enemy firing on friendly, i.e., when input for Blue side data, this is Red firing on Blue, and for input to Red data, this is Blue firing on Red.

See para 5-4c of Part I for the algorithm employing these factors.

PERSONNEL KILLED IN ACTION (KIA) CARD

FORMAT

2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"PERSNKIA"
Col 9-10	Blank
Col 11-16	Fraction personnel casualties KIA for BAD
Col 17-22	Fraction personnel casualties KIA for BAPD
Col 23-28	Fraction personnel casualties KIA for BAHD
Col 29-34	Fraction personnel casualties KIA for ME
Col 35-40	Fraction personnel casualties KIA for RAHD
Col 41-46	Fraction personnel casualties KIA for RAPD
Col 47-52	Fraction personnel casualties KIA for RAD
Col 53-58	Fraction personnel casualties KIA for Quiet
Col 59-64	Fraction personnel casualties KIA for Reserve
Col 65-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

PERSONNEL WOUNDED IN ACTION (WIA) CARD

FORMAT

2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"PERSNWIA"
Col 9-10	Blank
Col 11-16	Fraction personnel casualties WIA for BAD
Col 17-22	Fraction personnel casualties WIA for BAPD
Col 23-28	Fraction personnel casualties WIA for BAHD
Col 29-34	Fraction personnel casualties WIA for ME
Col 35-40	Fraction personnel casualties WIA for RAHD
Col 41-46	Fraction personnel casualties WIA for RAPD
Col 47-52	Fraction personnel casualties WIA for RAD
Col 53-58	Fraction personnel casualties WIA for Quiet
Col 59-64	Fraction personnel casualties WIA for Reserve
Col 65-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: Personnel CMIA = total personnel casualties - personnel WIA and KIA.

CONSTANT SECTION ERROR
MESSAGES/DIAGNOSTICS

"LABEL ERROR - ABOVE CARD SHOULD BE _____"

The label, Cols 1-8, is incorrect. Check spelling and count of expected cards of the type specified by diagnostic message.

"***WARNING - SUM OF INTELLIGENCE COEFFICIENTS NOT EQUAL TO ONE"

The army or corps intelligence coefficient a, b, c, or e and f in the case of a TOS yes, sum to greater than one (1). This does not terminate CEM preprocessor as the user may well wish to examine such parametric analysis. However, the user is cautioned that the algorithm was not designed with such value(s) in mind.

"***THRESHOLD STATE VALUE OUT OF RANGE"

The mission threshold state for division is either less than zero (0) or greater than one hundred (100), either value is out of computational range.

"***SUM OF ASSIMILATION FRACTIONS NOT EQUAL TO ONE"

The percentage of resources assimilated up to 10 division cycles does not equal one hundred percent (100%) of those arriving.

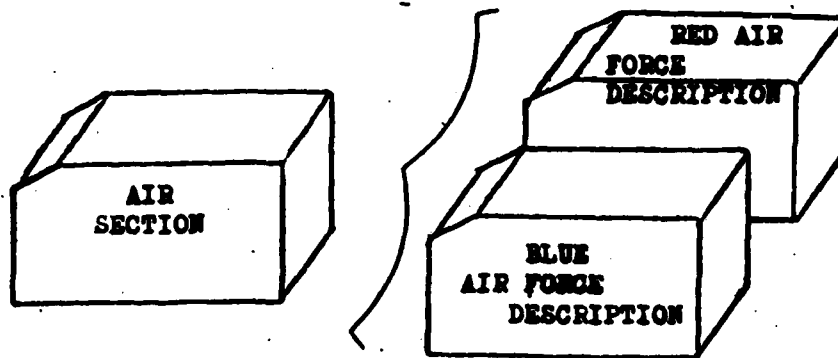
"***DIVISION GS ARTY ALLOCATION GREATER THAN ONE"

The percentage of GS artillery converted to DS may not exceed one hundred percent (100%) of that artillery. (For Blue max of 3 brigades/division.)

"***NEGATIVE VALUE NOT PERMITTED"

Check last card read (last card listed).

AIR SECTION



The Air Section defines data required by the Air Submodel to control mission, IFP, attrition, SAM and ADA units, and the threshold for the reallocation of aircraft. Data formats and descriptions are included as follows:

Sample Blue and Red Air Input Data Card Listing

Air Section Card

Run/Repeat Options Card

Initial Aircraft Counts Card

Initial SAM/ADA Counts Card

Initial Effort Allocation Card

Low Effort Allocation Bounds Card

High Effort Allocation Bounds Card

Aircraft Attrition Thresholds Card

Mission Allocation Change Increment Card

FEBA Movement Thresholds Card

Friendly Air Environment Threshold Card

SAM to ADA Conversion Factors Card

SAM/ADA Expenditure Rate Card

Scramble Rates Card

Aircraft Risk, Shelter, and Counterair Card

Close Air Support Data Card

TAC Fighter Squadron (CAS) IFP Card

Air-to-Air Kill Probabilities Card

Air-to-ground-to-Air Kill Probabilities Card

Filler Aircraft Count Card

Filler Aircraft Specification Card

Air Section Error Messages/Diagnostics Description

SECTION	AIR	SE	IGNOR	5					
AIRMOD	PRINT								
INITAC	945	295	454	.20					BLU
INITADA	23	88	141						BLU
INITALFR	.12	.26	.62						BLU
ALLOBNDS	.04	.10	.40						BLU
ALHIBNDS	.26	.50	.86						BLU
ATRTTHRS	.04	.04	.12						BLU
ALLOCHNG	-.02	-.01	.00	.02	-.02	-.02	-.01	-.02	BLU
ALLOCHNG	-.02	.02	-.02	-.02	.00	.02	-.02	.00	BLU
ALLOCHNG	.04	-.01	.02	.00	.02	.00	.03	.02	BLU
FBMVTTHRS	25.	48.							BLU
FAENTHRS	\$200								BLU
SMCNVCT	3.0	3.8							BLU
ADSMEXPR	10.0	1.5							BLU
SCRAMBLE	1.1	1.2							BLU
RISKDATA	.35	.20	696.	.18					BLU
CASDATA		11.33	18	.0200	.0225	.0250			BLU
CASIFPS	1.9000	.4900	1.4000	.4					BLU
PROBKAIR	.281	.144	.023	.123	.134				BLU
PROBKOND	.62	.19	.89	.000019	.000028				BLU
FCARDKNT	4								BLU
ACFILLER	2	206	175	76	0	18			BLU
ACFILLER	4	75	26	17	0	8			BLU
ACFILLER	5	47	28	11	4	0			BLU
ACFILLER	8	45	18	16	0	0			BLU
INITAC	1162	270	737	.25					RED
INITADA	41	25	354						RED
INITALFR	.14	.43	.43						RED
ALLOBNDS	.04	.18	.26						RED
ALHIBNDS	.24	.62	.78						RED
ATRTTHRS	.04	.04	.12						RED
ALLOCHNG	-.01	-.01	.00	.01	-.02	-.02	-.01	-.02	RED
ALLOCHNG	-.02	.02	-.02	-.01	.01	.02	-.02	.00	RED
ALLOCHNG	.03	-.01	.02	.00	.01	.00	.03	.02	RED
FBMVTTHRS	20.	30.							RED
FAENTHRS	4000								RED
SMCNVCT	2.0	2.5							RED
ADSMEXPR	15.0	1.0							RED
SCRAMBLE	1.3	1.5							RED
RISKDATA	.40	.25	974.	.10					RED
CASDATA		86.33	12	.0847	.0974	.1102			RED
CASIFPS	0.399	0.096	0.232	.4					RED
PROBKAIR	.261	.072	.009	.046	.023				RED
PROBKOND	.40	.10	.51	.000017	.000026				RED
FCARDKNT	3								RED
ACFILLER	4	49	14	45	24	27			RED
ACFILLER	7	48	4	40	6	0			RED
ACFILLER	10	51	8	34	18	10			RED

AIR SECTION CARD

FORMAT 2A4,2X,2A4,2X,2A4,2X,I5,37X,A3,I5

Col 1- 8	"SECTION"
Col 9-10	Blank
Col 11-18	"AIR" (left justified)
Col 19-20	Blank
Col 21-28	"SEQCOMNT" ignore out-of-sequence cards, but comment
	"SEQABORT" abort preprocessor run if Cols 76-80 not in ascending sequence
	"SEQIGNOR" ignore and do not comment on out-of- sequence cards
Col 29-30	Blank
Col 31-35	Logical input unit for this section of data
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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RUN/REPORT OPTION CARD

FORMAT

2A4,2X,2A4,2X,2A4,44X,A3,I5

Col 1- 8	"AIROPTNS"
Col 9-10	Blank
Col 11-18	"NOAIRMOD" CEM will bypass air model
	"AIRMOD" CEM will execute air model
Col 19-20	Blank
Col 21-28	"SUPPRESS" no air model reports
	"PRINT" print air model reports
Col 29-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

INITIAL AIRCRAFT COUNTS CARD

FORMAT

2A4,2X,3F10.0,F10.2,22X,A3,I5

Col 1- 8

"INITAC"

Col 9-10

Blank

Col 11-20

Count of TAC fighters on primary bases

Col 21-30

Count of TAC fighters on sanctuary bases

Col 31-40

Count of air defense fighters on primary bases

Col 41-50

Sweep fighters/TAC fighters ratio (fraction of total input TAC fighters that perform as sweep fighters $\geq 0, \leq 1.0$)*

Col 51-72

Optional comments

Col 73-75

Sequence label

Col 76-80

Sequence number

*See para 7-2b of Part I for use of this fraction.

CAA-D-80-3

INITIAL SAM/ADA COUNTS CARD

FORMAT

2A4,2X,3F10.0,32X,A3,I5

Col 1- 8	"INITADA"
Col 9-10	Blank
Col 11-20	Quantity of high altitude SAM (units)*
Col 21-30	Quantity of low altitude SAM (units)*
Col 31-40	Quantity of air defense artillery fire units
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Unit of resolution related to conversion factor on "SMCNVFT" card.

INITIAL EFFORT ALLOCATION CARD

FORMAT 2A4,2X,3F10.2,32X,A3,I5

Col 1- 8	"INITALFR"
Col 9-10	Blank
Col 11-20	Fraction of TAC fighters initially allocated to armed recon and interdiction role
Col 21-30	Fraction of TAC fighters initially allocated to counterair role
Col 31-40	Fraction of TAC fighters initially allocated to close air support role
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: The sum of the three fractions entered on this card must = 1.0.

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LOW EFFORT ALLOCATION BOUNDS CARD

FORMAT 2A4,2X,3F10.2,32X,A3,15

Col 1- 8	"ALLOBNDS"
Col 9-10	Blank
Col 11-20	Smallest fraction of TAC fighters which may be allocated to the armed recon and interdiction role
Col 21-30	Same as Cols 16-20 but for counterair role
Col 31-40	Same as Cols 11-20 but for close air support role
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: See Table 7-1 of Part I for employment of these values.

HIGH EFFORT ALLOCATION BOUNDS CARD

FORMAT 2A4,2X,3F10.2,32X,A3,I5

Col 1- 8	"ALHIBNDS"
Col 9-10	Blank
Col 11-20	Largest fraction of TAC fighter which may be allocated to armed recon and interdiction role
Col 21-30	Same as Cols 11-20 but for counterair role
Col 31-40	Same as Cols 11-20 but for close air support role
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: See Table 7-1 of Part I for employment of these values.

CAA-D-80-3

AIRCRAFT ATTRITION THRESHOLDS CARD

FORMAT 2A4,2X,3F10.2,32X,A3,I5

Col 1- 8	"ATRTTHRS"
Col 9-10	Blank
Col 11-20	Maximum acceptable attrition rate threshold in AR/I role*
Col 21-30	Maximum acceptable attrition rate threshold in CA role*
Col 31-40	Maximum acceptable attrition rate threshold for aircraft on primary airbases**
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

* Number of losses/theater period

Number of sorties/theater period

** Number of losses in theater period

Airbase inventory at beginning of theater period

Note: See Table 7-1 of Part I for employment of these values.

MISSION ALLOCATION CHANGE INCREMENT CARD

FORMAT

2A4,2X,8F5.2,22X,A3,I5

Col 1- 8	"ALLOCHNG"	AR/I	CA	AIRBASE
Col 9-10	Blank			
Col 11-15	Percent change/mission allocation for No*	No	No	No
Col 16-20	Percent change/mission allocation for No	No	No	Yes
Col 21-25	Percent change/mission allocation for No	Yes	Yes	No
Col 26-30	Percent change/mission allocation for No	Yes	Yes	Yes
Col 31-35	Percent change/mission allocation for Yes	No	No	No
Col 36-40	Percent change/mission allocation for Yes	No	No	Yes
Col 41-45	Percent change/mission allocation for Yes	Yes	Yes	No
Col 46-50	Percent change/mission allocation for Yes	Yes	Yes	Yes
Col 51-72	Optional comments			
Col 73-75	Sequence label			
Col 76-80	Sequence number			

There are eight entries per card, which correspond to eight possible combinations of the three attrition thresholds being exceeded.

Note that the total allocation changes for a given situation for all missions are obtained by reading down the same column of numbers of the three data cards; for example, in a situation when only the airbase attrition threshold is exceeded, the appropriate changes would be selected from Cols 16-20 on each data card.

Also, the changes are directly additive. In a situation where the current mission allocation percentages are 50 percent for AR/I, 25 percent to CA, and 25 percent to CAS; and the allocation changes dictated by the attrition thresholds were -10 percent to AR/I, 5 percent to CA, and 5 percent to CAS--the new allocations would be 40 percent to AR/I, 30 percent to CA, and 30 percent to CAS. The allocation changes are expressed in terms of percentage of total aircraft, rather than percentage of current mission allocation. (See Table 7-1 of Part I for more explanation.)

From the above two statements, it is obvious that the sum of all allocation changes for a given situation must be equal to zero, to avoid allocating other than 100 percent of available aircraft.

Card 1 = AR/I allocation change increment
 Card 2 = CA allocation change increment
 Card 3 = CAS allocation change increment

*No - current attrition rate is less than specified threshold.
 Yes - current allocation rate exceeds specified threshold.

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FEBA MOVEMENT THRESHOLDS CARD

FORMAT 2A4,2X,2F10.2,42X,A3,I5

Col 1- 8 "FBMVTHRS"
Col 9-10 Blank

Col 11-20 Low panic threshold - if the average FEBA movement (hm/DIV cycle) (See MOVEFCTR card description in SCENARIO SECTION) exceeds this value, all effort previously allocated to AR/I mission will be temporarily diverted to CAS. (≥ 0)

Col 21-30 High panic threshold - if the average FEBA movement (hm/DIV cycle) exceeds this value, all air effort will be temporarily diverted to CAS. (≥ 0)

Col 31-72 Optional comments
Col 73-75 Sequence label
Col 76-80 Sequence number

Notes: In addition to the regularly scheduled daily changes in air mission allocation, the air model has the capability of operating in "panic mode"; depending on the smoothed average ground rate, it will temporarily direct aircraft to a close air support (CAS) role, if the friendly ground forces are being pushed back too rapidly. The two thresholds, in effect, tell the air model when to panic and how much. (See para 7-2b of Part I.)

"Temporary diversion" means that, as soon as the average movement coefficient drops below the panic threshold again, previous effort allocations will be restored.

FRIENDLY AIR ENVIRONMENT THRESHOLD CARD

FORMAT 2A4,2X,F10.0,52X,A3,I5

Col 1- 8	"FAENTHRS"
Col 9-10	Blank
Col 11-20	Enemy aircraft density threshold for loss of friendly air environment*
Col 21-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Number of successful enemy CA and AR/I sorties during the current theater cycle, above which the friendly air environment will be lost. Loss of friendly air environment could mean extra delays in reserve commitments at army and corps levels, and extra delays in the arrival of replacements and resupply.

CAA-D-80-3

SAM TO ADA CONVERSION FACTORS CARD

FORMAT 2A4,2X,2F10.2,42X,A3,I5

Col 1- 8	"SMCNVFACT"
Col 9-10	Blank
Col 11-20	Conversion factor of high altitude SAM to ADA fire unit
Col 21-30	Conversion factor of low altitude SAM to ADA fire unit
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: See para 7-2d of Part I for use of these factors.

SAM/ADA EXPENDITURE RATE CARD

FORMAT 2A4,2X,2F10.2,42X,A3,I5

Col 1- 8	"ADSMEXPR"
Col 9-10	Blank
Col 11-20	SAM tons/aircraft killed by SAM
Col 21-30	ADA tons/aircraft killed by ADA
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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SCRAMBLE RATES CARD

FORMAT

2A4,2X,2F10.2,42X,A3,I5

Col 1- 8	"SCRAMBLE"
Col 9-10	Blank
Col 11-20	TAC fighters daily sortie rate/aircraft
Col 21-30	Air defense fighters daily sortie rate/aircraft
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

AIRCRAFT RISK, SHELTER, AND COUNTERAIR CARD

FORMAT	2A4,2X,2F10.2,F10.0,F10.2,22X,A3,15
Col 1- 8	"RISKDATA"
Col 9-10	Blank
Col 11-20	Fraction of TAC fighters at risk on primary bases
Col 21-30	Fraction of air defense fighter at risk on primary bases
Col 31-40	Quantity of aircraft shelters on primary bases
Col 41-50	Fraction of counterair (CA) allocated to attack SAM sites
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: See para 7-2e in Part I for explanation of this factor.

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CLOSE AIR SUPPORT DATA CARD

FORMAT

2A4,2X,2F10.2,F10.0,3F10.4,2X,A3,I5

Col 1-8	"CASDATA"
Col 9-20	Blank
Col 21-30	Average quantity of air defense fire units in the division ADA, per Blue brigade or Red division
Col 31-40	Number of aircraft in each CAS squadron
Col 41-50	Loss rate in support of ground force units in delay mission*
Col 51-60	Loss rate in support of ground force units in defend mission*
Col 61-70	Loss rate in support of ground force units in attack mission*
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

*Loss rate is in terms of aircraft lost per squadron, per enemy AD fire unit, per division cycle on the basis of one AD fire unit per minisector density.

TAC FIGHTER SQUADRON (CAS) IFPS CARD

FORMAT	2A4,2X,4F10.0,22X,A3,I5
Col 1- 8	"CASIFPS"
Col 9-10	Blank
Col 11-20	Antitank IFP*
Col 21-30	Antilight armor IFP*
Col 31-40	Antipersonnel IFP*
Col 41-50	Fraction of GS CAS allocated to counterbattery (CB) role**
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*IFP/squadron in CAS role/division cycle

**The remaining GS CAS is directed against reserve units, blank = 0, entry greater than 1.0 or negative is not valid and will cause program termination.

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AIR-TO-AIR KILL PROBABILITIES CARD

FORMAT 2A4,2X,5F10.4,12X,A3,I5

Col 1- 8	"PROBKAIR"
Col 9-10	Blank
Col 11-20	Probability air defense fighter will intercept enemy penetrator aircraft
Col 21-30	Probability air defense fighter kills intercepted penetrating TAC fighter
Col 31-40	Probability penetrating TAC fighter kills intercepting air defense fighter
Col 41-50	Probability air defense fighter kills intercepted penetrating sweep fighter
Col 51-60	Probability penetrating sweep fighter kills intercepting air defense fighter
Col 61-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: See para 7-2c in Part I for explanation and algorithms employing these probability figures.

AIR-TO-GROUND-TO-AIR KILL PROBABILITIES CARD

FORMAT	2A4,2X,5F10.0,12X,A3,I5
Col 1- 8	"PROBKGND"
Col 9-10	Blank
Col 11-20	Probability of kill against enemy aircraft parked in open per penetrating TAC fighter attacking aircraft*
Col 21-30	Probability of kill against sheltered enemy aircraft per penetrating TAC fighter attacking aircraft*
Col 31-40	Number of kills against enemy air defense fire units per penetrating TAC fighter attacking SAM**
Col 41-50	Probability of TAC fighter aircraft killed in AR/I role/sortie/air defense fire unit***
Col 51-60	Probability of TAC fighter aircraft killed in CA role/sortie/air defense fire unit***
Col 61-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*See para 7-2e in Part I for algorithm employing these probability factors.

**See para 7-2e in Part I for explanation of the use of this probability factor.

***See para 7-2d in Part I for explanation and algorithm employing these probability factors.

CAA-D-80-3

FILLER AIRCRAFT COUNT CARD

FORMAT

2A4,2X,I5,57X,A3,I5

Col 1- 8

"FCARDKNT"

Col 9-10

Blank

Col 11-15

Count of "ACFILLER" cards to follow this card

Col 16-72

Optional comments

Col 73-75

Sequence label

Col 76-80

Sequence number

FILLER AIRCRAFT SPECIFICATION CARD

FORMAT	2A4,2X,I5,5X,5F10.0,2X,A3,I5
Col 1- 8	"ACFILLER"
Col 9-10	Blank
Col 11-15	Theater cycle aircraft on this card will come into operation
Col 16-20	Blank
Col 21-30	Quantity of attack fighters on primary bases
Col 31-40	Quantity of attack fighters on sanctuary bases
Col 41-50	Quantity of air defense fighters on primary bases
Col 51-60	Quantity of high altitude SAMs
Col 61-70	Quantity of low altitude SAMs
Col 71-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: The preceding card has specified the quantity of these cards required to schedule aircraft replenishment/reinforcement. "ACFILLER" cards must be in ascending order by theater cycle.

AIR SECTION ERROR
MESSAGES/DIAGNOSTICS

***ILLEGAL USAGE OPTION"

Two options permitted are: "NOAIRMOD" and "AIRMOD," both must begin in Col 11.

***ILLEGAL PRINT OPTION"

Two options permitted are: "SUPPRESS" and "PRINT," both must begin in Col 21.

***NEITHER SIDE HAS AIRCRAFT"

The sum of attack fighter on primary bases + attack fighters on sanctuary bases + sweep fighters on primary bases = 0.

***ALLOCATION SUM NOT EQUAL TO ONE"

The sum of the percentages for initial efforts in armed recon/intradiction (AR/I), counterair (CA), and close air support (CAS) must equal one (1).

***ALLOCATION CHANGE ENTRY OUT OF RANGE"

The allocation change increments sum to greater than 100 percent.

***SUM OF ENTRIES IN COLUMN XX NE ONE"

The sum of any changes column on each "ALLOCHNG" card for AR/I + CA + CAS = 0.

***PROBABILITY OUT OF RANGE"

The probability(ies) for air-to-air or air-to-ground kill is (are) either less than zero (0) or greater than one (1).

***LOW-ALTITUDE SAM CONVERSION FACTOR MAY NOT BE ZERO"

The conversion factor for low-altitude SAM to ADA fire unit is zero.

***FILLER CARDS NOT IN ASCENDING CYCLE ORDER"

The sequence of these "ACFILLER" cards must be in ascending theater cycles.

"***THEATER CYCLE OUT OF RANGE"

The theater cycle specified on the "ACFILLER" card, Cols 11-15, is greater than that specified for simulation duration on the "RUN-LIMIT" card, Cols 11-15.

"***WARNING - ZERO EXPENDITURE RATE"

The expenditure rate for the SAM and/or ADA fire unit is zero.

"***NEGATIVE VALUE ON ABOVE CARD"

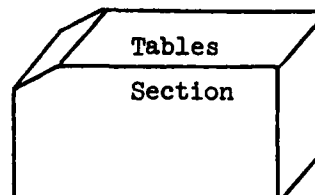
This error message is generated by all the following card inputs.

1. Label = "INITAC"
all values must be ≥ 0 .
2. Label = "INITADA"
all values must be ≥ 0 .
3. Label = "INITALFR"
all values must be ≥ 0 .
4. Label = "ALLOBNDS"
all values must be ≥ 0 .
5. Label = "ALHIBNDS"
all values must be ≥ 0 .
6. Label = "ATRTTHRS"
all values must be ≥ 0 .
7. Label = "FBNVTHRS"
all values must be ≥ 0 .
8. Label = "FAENTHRS"
all values must be ≥ 0 .
9. Label = "SMCNVFCT"
all values must be ≥ 0 .
10. Label = "ADSMEXPR"
all values must be ≥ 0 .
11. Label = "RISKDATA"
all values must be ≥ 0 .

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12. Label = "CASDATA"
all values must be ≥ 0 .
13. Label = "CASIFPS"
all values must be ≥ 0 .
14. Label = "ACFILLER"
all values must be ≥ 0 .

TABLES SECTION



The Tables Section contains tables illustrated in Figure 1-6 that control or modify, as a function of engagement type, the relative effectiveness of the forces. Each force may contain several components that produce varying effectiveness against different opponents on different terrain and postures. An understanding of this section and its contents is essential; the user is directed to Volume II, "Methodology," for cross-reference purposes. The following formats and descriptions are included:

Table Section Deck Structure, Figure 1-6

Sample Table Input Data Card Listing

Tables Section Card

Estimation Thresholds

Outcome Thresholds

Arty Table Card

Terrain Factors Card

Barrier Effectiveness Index

Posture Factor Card

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Helicopter Kill Rate Card

Helicopter Loss Rate Card

FEBA Movement Cards

Decimated Red Division Factors

Table Section Error Messages/Diagnostics Description

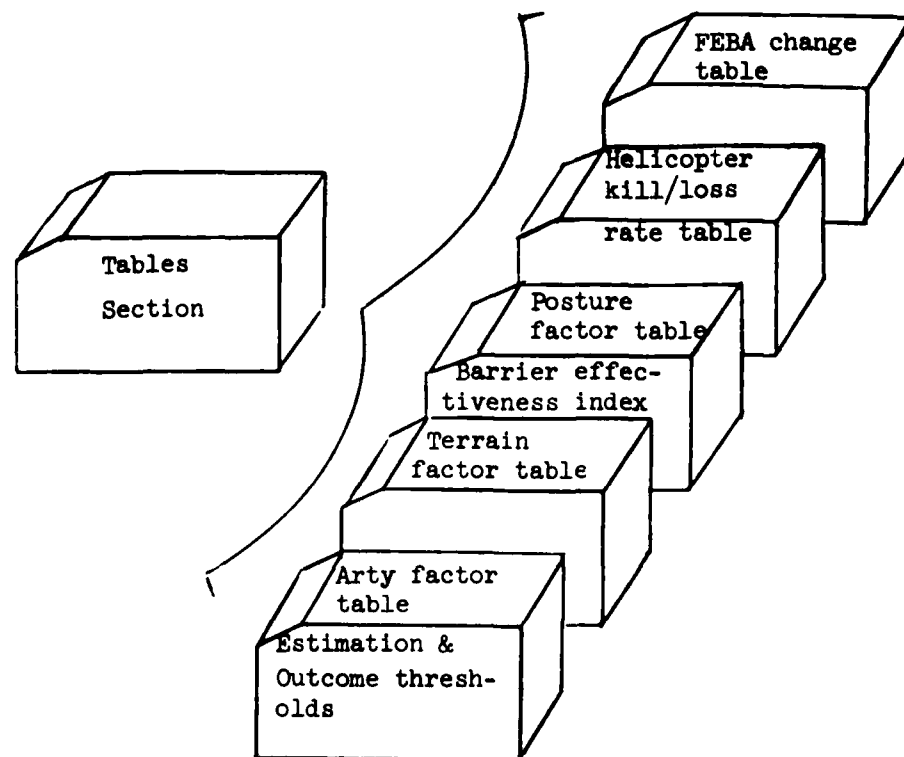


Figure 1-6. Table Section Deck Structure

SECTION	TABLES		SEIGEMOR		5												TCF
ESTHRSMD	3.00	1.00	3.00	1.50	3.00	1.25	2.00	1.00							BLU		
ESTHRSMD	3.00	1.00	1.30	1.10	1.20	1.00	0.30	0.20							RED		
OUTHRSMD	5.00	3.75	2.50	1.25	2.40	1.70	1.30	1.10									
OUTHRSMD	2.30	1.70	1.30	1.00	4.00	2.00	0.50	0.25							TCF		
C3FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.90	0.90	BLU				
C3FACTOR	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	BLU				
C3FACTOR	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	BLU				
C3FACTOR	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	BLU				
C3FACTOR	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	BLU				
C3FACTOR	5.70	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	BLU				
C3FACTOR	6.65	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	BLU				
C3FACTOR	7.20	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	BLU				
C3FACTOR	8.10	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	BLU				
C3FACTOR	8.50	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	BLU				
C3FACTOR	9.35	10.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	BLU				
C3FACTOR	9.60	11.4	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	BLU				
C3FACTOR	9.75	12.4	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	BLU				
C3FACTOR	10.5	13.3	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	BLU				
C3FACTOR	11.3	14.3	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	BLU				
C3FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.90	0.90	RED					
C3FACTOR	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	RED				
C3FACTOR	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	RED				
C3FACTOR	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	RED				
C3FACTOR	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	RED				
C3FACTOR	5.70	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	RED				
C3FACTOR	6.65	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	RED				
C3FACTOR	7.20	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	RED				
C3FACTOR	8.10	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	RED				
C3FACTOR	8.50	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	RED				
C3FACTOR	9.35	10.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	RED				
C3FACTOR	9.60	11.4	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	RED				
C3FACTOR	9.75	12.4	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	RED				
C3FACTOR	10.5	13.3	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	RED				
C3FACTOR	11.3	14.3	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	RED				
TERFACTR	1.45		1.20		0.81		1.11		1.33		1.11A-AT						
TERFACTR	1.45		1.20		0.81		1.11		1.33		1.11A-ALA						
TERFACTR	1.20		1.20		0.81		1.11		1.33		1.11A-AP						
TERFACTR	1.00		1.00		1.00		1.00		1.00		1.00B-AT						
TERFACTR	1.00		1.00		1.00		1.00		1.00		1.00B-ALA						
TERFACTR	1.00		1.00		1.00		1.00		1.00		1.00B-AP						
TERFACTR	0.65		0.67		1.20		0.89		0.72		0.89C-AT						
TERFACTR	0.65		0.67		1.20		0.89		0.72		0.89C-ALA						
TERFACTR	0.67		0.67		1.20		0.89		0.72		0.89C-AP						
TERFACTR	1.00		1.00		1.00		1.11		1.33		1.110-AT						
TERFACTR	1.00		1.00		1.00		1.11		1.33		1.110-ALA						
TERFACTR	1.00		1.00		1.00		1.11		1.33		1.110-AP						
TERFACTR	1.45		1.20		0.81		1.11		1.33		1.11A-AT						
TERFACTR	1.45		1.20		0.81		1.11		1.33		1.11A-ALA						
TERFACTR	1.20		1.20		0.81		1.11		1.33		1.11A-AP						
TERFACTR	1.00		1.00		1.00		1.00		1.00		1.00B-AT						
TERFACTR	1.00		1.00		1.00		1.00		1.00		1.00B-ALA						
TERFACTR	1.00		1.00		1.00		1.00		1.00		1.00B-AP						
TERFACTR	0.65		0.67		1.20		0.89		0.72		0.89C-AT						
TERFACTR	0.65		0.67		1.20		0.89		0.72		0.89C-ALA						
TERFACTR	0.67		0.67		1.20		0.89		0.72		0.89C-AP						
TERFACTR	1.00		1.00		1.00		1.00		1.00		1.000-AT						

TERFACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00-ALA
TERFACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.000-AF
GAREFFECT	1.0	1.0	1.0	1.0			TCF
POSFACR	.555	.772	.765	1.00	1.68	1.71	HARD
POSFACR	.642	.908	.899	1.00	1.66	1.67	MEDIUM
POSFACR	.578	.821	.887	1.00	1.73	1.74	SOFT
POSFACR	.602	.728	.726	1.00	1.64	1.64	HELI
POSFACR	.614	.951	1.04	1.00	1.56	1.56	ARTY
POSFACR	1.00	1.00	1.00	1.00	.470	.470	CAS
POSFACR	.886	1.73	1.70	1.00	.876	.884	HARD
POSFACR	.967	1.66	1.66	1.00	.945	.948	MEDIUM
POSFACR	.959	1.79	1.78	1.00	1.03	1.00	SOFT
POSFACR	.875	1.72	1.71	1.00	.642	.633	HELI
POSFACR	.878	1.56	1.56	1.00	.956	.885	ARTY
POSFACR	.540	.470	.470	1.00	1.00	1.00	CAS
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 1 VS RED DIV 1
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 1 VS RED DIV 2
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 1 VS RED DIV 3
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 2 VS RED DIV 1
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 2 VS RED DIV 2
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 2 VS RED DIV 3
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 3 VS RED DIV 1
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 3 VS RED DIV 2
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 3 VS RED DIV 3
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 4 VS RED DIV 1
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 4 VS RED DIV 2
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 4 VS RED DIV 3
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 5 VS RED DIV 1
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 5 VS RED DIV 2
HELKRLT	.050	.100	.100	.100	.100	.080	B HELI 5 VS RED DIV 3
HELILSRT	.150	.150	.150	.150	.150	.150	ACCEPTABLE LOSS RATE
HELILSRT	.050	.100	.100	.100	.100	.050	R HELI 1 VS BLUE
HELILSRT	.150	.150	.150	.150	.150	.150	ACCEPTABLE LOSS RATE
FEBACHNG	10	20	50	100	200	0	2 7 18 0 5
FEBACHNG	10	20	40	-40	-20	0	20 40 0 -5 -10 -20
FEBACHNG	-40	0	-1	-2	-7	-18	-10 -20 -50 -100 -200 8
FEBACHNG	15	32	77	134	0	1	2 5 12 0 3 7
FEBACHNG	10	20	-27	-14	0	14	27 0 -3 -7 -10 -20
FEBACHNG	0	-1	-2	-5	-12	-8	-15 -32 -77 -134 5 10
FEBACHNG	18	33	66	0	0	1	3 6 0 1 3 5
FEBACHNG	10	-14	-7	0	7	14	0 -1 -3 -5 -10 0
FEBACHNG	0	-1	-3	-6	-5	-10	-18 -33 -66 0 0 1
FEBACHNG	1	1	0	0	1	1	0 0 1 1 1 TCF
FEBACHNG	0	0	0	0	0	0	-1 -1 -1 0 0 TCF
FEBACHNG	-1	-1	-1	0	0	-1	-1 TCF
REDECMTH	40	40	4	40	1	8	30 50

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TABLES SECTION CARD

FORMAT

2A4,2X,2A4,2X,2A4,2X,15,37X,A3,15

Col 1- 8	"SECTION"
Col 9-10	Blank
Col 11-18	"TABLES"
Col 19-20	Blank
Col 21-28	"SEQCOMNT" ignore out-of-sequence cards, but comment
	"SEQABORT" abort preprocessor run if Col 76-80 not in ascending sequence
	"SEQIGNOR" ignore and do not comment on out-of- sequence cards
Col 29-30	Optional comments
Col 31-35	Logical input unit for this section of data
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

ESTIMATION OUTCOME THRESHOLDS CARD

FORMAT 2A4,2X,8F5.2,22X,A3,I5

Col 1- 8	"ESTHRSHD"
Col 9-10	Blank
Col 11-15	An expected attacker/defender ratio greater than or equal to this entry will be a win for the attacker in a (delay) mission.
Col 16-20	A ratio less than the win entry above, but greater than or equal to this entry, is a draw in a delay mission. Less than this entry is a loss for the attacker in a (delay) mission.
Col 21-25	(Prepared defense) as above Col 11-15
Col 26-30	(Prepared defense) as above Col 16-20
Col 31-35	(Hasty defense) as above Col 11-15
Col 36-40	(Hasty defense) as above Col 16-20
Col 41-45	(Meeting engagement) as above Col 11-15
Col 46-50	(Meeting engagement) as above Col 16-20
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: See para 6-2a and 6-3 of Part I for more information on these division decision thresholds.

Card required for Blue and Red--first card Blue, second card Red.

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ASSESSMENT OUTCOME THRESHOLDS CARD (1)

FORMAT

2A4,2X,8F5.2,22X,A3,I5

Col 1- 8	"OUTHRSHD"
Col 9-10	Blank
Col 11-15	An outcome (attacker/defender ratio) greater than or equal to this entry will be an overwhelming win in (delay mission).
Col 16-20	An outcome less than an overwhelming win above, but greater than or equal to this entry, is a win in (delay mission).
Col 21-25	An outcome less than a win but greater or equal to this entry is a draw in (delay mission).
Col 26-30	An outcome less than a draw but greater or equal to this entry is a loss in (delay mission). Less than this entry is an overwhelming loss.
Col 31-35	(Prepared defense) as above Col 11-15.
Col 36-40	(Prepared defense) as above Col 16-20.
Col 41-45	(Prepared defense) as above Col 21-25.
Col 46-50	(Prepared defense) as above Col 26-30.
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

ASSESSMENT OUTCOME THRESHOLDS CARD (2)

FORMAT	2A4,2X,8F5.2,22X,A3,I5
Col 1- 8	"OUTHRSHD"
Col 9-10	Blank
Col 11-15	(Hasty defense) as preceding page Col 11-15.
Col 16-20	(Hasty defense) as preceding page Col 16-20.
Col 21-25	(Hasty defense) as preceding page Col 21-25.
Col 26-30	(Hasty defense) as preceding page Col 26-30.
Col 31-35	(Meeting engagement) as preceding page Col 11-15.
Col 36-40	(Meeting engagement) as preceding page Col 16-20.
Col 41-45	(Meeting engagement) as preceding page Col 21-25.
Col 46-50	(Meeting engagement) as preceding page Col 26-30.
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number



ARTILLERY COORDINATION DEGRADATION FACTOR TABLE CARD

FORMAT	2A4,2X,12F5.0,2X,A3,15
Col 1- 8	"C3FACTOR"
Col 9-10	Blank
Col 11-15	Effective arty bns for: 1 arty bn in support of 1 maneuver bn
Col 16-20	Effective arty bns for: 1 arty bn in support of 2 maneuver bns
Col 21-25	Effective arty bns for: 1 arty bn in support of 3 maneuver bns
Col 26-30	Effective arty bns for: 1 arty bn in support of 4 maneuver bns
Col 31-35	Effective arty bns for: 1 arty bn in support of 5 maneuver bns
Col 36-40	Effective arty bns for: 1 arty bn in support of 6 maneuver bns
Col 41-45	Effective arty bns for: 1 arty bn in support of 7 maneuver bns
Col 46-50	Effective arty bns for: 1 arty bn in support of 8 maneuver bns
Col 51-55	Effective arty bns for: 1 arty bn in support of 9 maneuver bns
Col 56-60	Effective arty bns for: 1 arty bn in support of 10 maneuver bns
Col 61-65	Effective arty bns for: 1 arty bn in support of 11 maneuver bns
Col 66-70	Effective arty bns for: 1 arty bn in support of 12 maneuver bns
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: There are fifteen (15) cards in the C3FACTOR table. The "C3FACTOR" cards give the number of effective artillery bns for the number of supporting arty bns ranging from 1 to 15, and on each card the number of maneuver bns being supported. (1st card is one supporting arty bn, 2d card is two arty bns, etc.) 15 cards for up to 15 arty bns. The first 15 cards are for Blue while the next 15 are for Red.

See para 5-3f of Part I for explanation of how this table is used to determine effective artillery battalions.

TERRAIN FACTORS CARD

FORMAT 2A4,2X,6F10.0,2X,A3,I5

Col 1- 8	"TERFACTR"
Col 9-10	Blank
Col 11-20	Effectiveness coefficient of hard weapon, ≥ 0 .
Col 21-30	Effectiveness coefficient of medium weapon, ≥ 0 .
Col 31-40	Effectiveness coefficient of soft weapon, ≥ 0 .
Col 41-50	Effectiveness coefficient of helicopter weapon, ≥ 0 .
Col 51-60	Effectiveness coefficient of artillery weapon, ≥ 0 .
Col 61-70	Effectiveness coefficient of CAS weapon, ≥ 0 .
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: The "TERFACTR" deck contains 24 cards as follows:

Card	Situation	Terrain	Enemy weapon
1	Defend or delay	A	AT
2	Defend or delay	A	ALA
3	Defend or delay	A	AP
4	Defend or delay	B	AT
5	Defend or delay	B	ALA
6	Defend or delay	B	AP
7-9	Defend or delay	C	AT,ALA,AP
10-12	Defend or delay	D	AT,ALA,AP
13-15	Attack	A	AT,ALA,AP
16-18	Attack	B	AT,ALA,AP
19-21	Attack	C	AT,ALA,AP
22-24	Attack	D	AT,ALA,AP

In a meeting engagement, the "attacker" portion of this data is used for both sides. In all other engagements the defender data is used for defender or delayer and attacker data for the attacker.

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BARRIER EFFECTIVENESS INDEX CARD

FORMAT 2A4,2X,4F6.2,38X,A3,I5

Col 1- 8	"BAREFFECT"
Col 9-10	Blank
Col 11-16	Barrier effectiveness index for terrain type A
Col 17-22	Barrier effectiveness index for terrain type B
Col 23-28	Barrier effectiveness index for terrain type C
Col 29-34	Barrier effectiveness index for terrain type D
Col 35-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

POSTURE FACTOR CARD

FORMAT

2A4,2X,7F5.0,27X,A3,I5

Col 1- 8	"POSFACTR"
Col 9-10	Blank
Col 11-15	Effectiveness coefficient for weapon type in BAD
Col 16-20	Effectiveness coefficient for weapon type in BAPD
Col 21-25	Effectiveness coefficient for weapon type in BAHD
Col 26-30	Effectiveness coefficient for weapon type in meeting engagement
Col 31-35	Effectiveness coefficient for weapon type in RAHD
Col 36-40	Effectiveness coefficient for weapon type in RAPD
Col 41-45	Effectiveness coefficient for weapon type in RAD
Col 46-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: Card

- 1 - Hard weapons
- 2 - Medium weapons
- 3 - Soft weapons
- 4 - Helicopters
- 5 - Artillery
- 6 - Close air support

These six cards are required for each side--first the six for Blue weapons, then the six for Red weapons.

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HELICOPTER KILL RATE CARD

FORMAT 2A4,2X,7F5.0,27X,A3,I5

Col 1- 8	"HELIKLRRT"
Col 9-10	Blank
Col 11-15	Helicopter kill rate for posture: BAD
Col 16-20	Helicopter kill rate for posture: BAPD
Col 21-25	Helicopter kill rate for posture: BAHD
Col 26-30	Helicopter kill rate for posture: meeting en- gagement
Col 31-35	Helicopter kill rate for posture: RAHD
Col 36-40	Helicopter kill rate for posture: RAPD
Col 41-45	Helicopter kill rate for posture: RAD
Col 46-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: Three cards:

Card 1 = Data for Blue against Red division type 1
Card 2 = Data for Blue against Red division type 2
Card 3 = Data for Blue against Red division type 3

These values are the expected division cycle attrition rate for Blue helicopters from Red divisional ground fire. (Three cards for each type of helicopter.)

See para 5-4d in Part I for algorithm employing these kill factors.

HELICOPTER LOSS RATE CARD

FORMAT

2A4,2X,7F5.0,27X,A3,I5

Col 1- 8	"HELILSRT"
Col 9-10	Blank
Col 11-15	Maximum acceptable loss rate - BAD
Col 16-20	Maximum acceptable loss rate - BAPD
Col 21-25	Maximum acceptable loss rate - BAHD
Col 26-30	Maximum acceptable loss rate - meeting engagement
Col 31-35	Maximum acceptable loss rate - RAHD
Col 36-40	Maximum acceptable loss rate - RAPD
Col 41-45	Maximum acceptable loss rate - RAD
Col 46-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: See para 5-3e in Part I for algorithm employing these acceptable loss factors.

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FEBA MOVEMENT CARD (1)

FORMAT 2A4,2X,6(2I5),2X,A3,I5

Col 1- 8	"FEBACHNG"
Col 9-10	Blank
Col 11-15	BAD, terrain A, overwhelming loss outcome
Col 16-20	BAD, terrain A, loss outcome
Col 21-25	BAD, terrain A, draw outcome
Col 26-30	BAD, terrain A, win outcome
Col 31-35	BAD, terrain A, overwhelming win outcome
Col 36-40	BAPD, terrain A, overwhelming loss outcome
Col 41-45	BAPD, terrain A, loss outcome
Col 46-50	BAPD, terrain A, draw outcome
Col 51-55	BAPD, terrain A, win outcome
Col 56-60	BAPD, terrain A, overwhelming win outcome
Col 61-65	BAHD, terrain A, overwhelming loss outcome
Col 66-70	BAHD, terrain A, loss outcome
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: All FEBA change values are hectometers per division cycle.

See Appendix A of Part II for explanation and methodology for deriving these values.

FEBA MOVEMENT CARD (2)

FORMAT

2A4,2X,6(2I5),2X,A3,I5

Col 1- 8	"FEBACHNG"
Col 9-10	Blank
Col 11-15	BAHD, terrain A, draw outcome
Col 16-20	BAHD, terrain A, win outcome
Col 21-25	BAHD, terrain A, overwhelming win outcome
Col 26-30	Meeting engagement, terrain A, overwhelming loss outcome
Col 31-35	Meeting engagement, terrain A, loss outcome
Col 36-40	Meeting engagement, terrain A, draw outcome
Col 41-45	Meeting engagement, terrain A, win outcome
Col 46-50	Meeting engagement, terrain A, overwhelming win outcome
Col 51-55	RAHD, terrain A, overwhelming loss outcome
Col 56-60	RAHD, terrain A, loss outcome
Col 61-65	RAHD, terrain A, draw outcome
Col 66-70	RAHD, terrain A, win outcome
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: All FEBA change values are hectometers per division cycle.

See Appendix A of Part II for explanation and methodology for deriving these values.

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FEBA MOVEMENT CARD (3)

FORMAT 2A4,2X,6(2I5),2X,A3,I5

Col 1- 8	"FEBACHNG"
Col 9-10	Blank
Col 11-15	RAHD, terrain A, overwhelming win outcome
Col 16-20	RAPD, terrain A, overwhelming loss outcome
Col 21-25	RAPD, terrain A, loss outcome
Col 26-30	RAPD, terrain A, draw outcome
Col 31-35	RAPD, terrain A, win outcome
Col 36-40	RAPD, terrain A, overwhelming win outcome
Col 41-45	RAD, terrain A, overwhelming loss outcome
Col 46-50	RAD, terrain A, loss outcome
Col 51-55	RAD, terrain A, draw outcome
Col 56-60	RAD, terrain A, win outcome
Col 61-65	RAD, terrain A, overwhelming win outcome
Col 66-70	BAD, terrain B, overwhelming loss outcome
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: All FEBA change values are hectometers per division cycle.

See Appendix A of Part II for explanation and methodology for deriving these values.

FEBA MOVEMENT CARD (4)

FORMAT

2A4,2X,6(2I5),2X,A3,I5

Col 1- 8	"FEBACHNG"
Col 9-10	Blank
Col 11-15	BAD, terrain B, loss outcome
Col 16-20	BAD, terrain B, draw outcome
Col 21-25	BAD, terrain B, win outcome
Col 26-30	BAD, terrain B, overwhelming win outcome
Col 31-35	BAPD, terrain B, overwhelming loss outcome
Col 36-40	BAPD, terrain B, loss outcome
Col 41-45	BAPD, terrain B, draw outcome
Col 46-50	BAPD, terrain B, win outcome
Col 51-55	BAPD, terrain B, overwhelming win outcome
Col 56-60	BAHD, terrain B, overwhelming loss outcome
Col 61-65	BAHD, terrain B, loss outcome
Col 66-70	BAHD, terrain B, draw outcome
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes: All FEBA change values are hectometers per division cycle.

See Appendix A of Part II for explanation and methodology for deriving these values.

FEBA MOVEMENT CARDS (5-12)

(Same format as previous FEBA movement cards.)

Card(5)	Terrain B; BAHD,(W,OW),MEETING,(OL,L,D,W,OW),RAHD,(OL,L,D,W,OW).
Card(6)	TERRAIN B; RAPD,(OL,L,D,W,OW),RAD(OL,L,D,W,OW), Terrain C; BAD,(OL,L).
Card(7)	Terrain C; BAD,(D,W,OW),BAPD,(OL,L,D,W,OW), BAHD,(OL,L,D,W).
Card(8)	Terrain C; BAHD,(OW),MEETING,(OL,L,D,W,OW), RAHD,(OL,L,D,W,OW),RAPD,(OL).
Card(9)	Terrain C; RAPD,(L,D,W,OW),RAD,(OL,L,D,W,OW), Terrain D; BAD,(OL,L,D).
Card(10)	Terrain D; BAD,(W,OW),BAPD,(OL,L,D,W,OW), BAHD,(OL,L,D,W,OW).
Card(11)	Terrain D; MEETING,(OL,L,D,W,OW),RAHD,(OL,L,D,W,OW), RAPD,(OL,L).
Card(12)	Terrain D; RAPD,(D,W,OW),RAD(OL,L,D,W,OW).

Notes: All FEBA change values are hectometers per division cycle.

See Appendix A of Part II for explanation and methodology for deriving these values.

DECIMATED RED DIVISION CARD

FORMAT	2A4,2X,8I5,22X,A3,I5
Col 1- 8	"REDECMTN"
Col 9-10	Blank
Col 11-15	"attack threshold" If the parent Red corps has an attack mission, any subordinate division with a state less than this entry will be considered decimated and withdrawn from the front. A minimum of one division in each corps will always remain on the front regardless of state.
Col 16-20	"defend threshold" If the parent Red corps has a defend mission, any subordinate division with a state less than this entry will be considered decimated and withdrawn from the front.
Col 21-25	Minimum time (army cycles) a decimated division must remain withdrawn before being considered for recommitment to front line.
Col 26-30	Minimum state a decimated division must achieve before being considered for front line.
Col 31-35	Switch to control resupply of decimated Red divisions. 0 = no priority of resupply. 1 = men and equipment go to <u>only</u> decimated divisions with the strongest (state) division getting priority.
Col 36-40	Maximum time (army cycles) a decimated division can remain withdrawn before being deactivated and stripped of assets.
Col 41-45	Time (army cycles, beginning at D-day) that the Red division rebuilding pool will operate and unit replacement will be used. After this time has expired, no further Red divisions will enter the rebuilding pool, and individual replacement will be used.
Col 46-50	Maximum percentage of the number of Red divisions in theater allowed in the rebuilding pool at one time. (If this entry is zero or blank, one hundred percent is assumed as a default.)
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: See para 4-2 in Part I for more information on the representation of Red division replacement.

TABLE SECTION ERROR
MESSAGES/DIAGNOSTICS

***C3 FACTOR TABLE APPEARS INCONSISTENT PLEASE RECHECK VALUES"

The value input into the C³ table is the effective quantity of artillery units being utilized by "X" (1-12) combat units being supported by "Y" (1-15) artillery units. It has been detected that less effective artillery units are being input for larger quantities of either combat or artillery units than was previously defined for some smaller quantity of either combat or artillery units.

***ENTRY XX ON ABOVE CARD IS INVALID"

An entry on the "C3FACTOR" card is less than or equal to zero (0).

***NEGATIVE VALUE NOT PERMITTED"

Negative values are not permitted on:

1. "TERFACTR" card
2. "POSFACTR" card
3. "HELIKLRRT" card
4. "HELILSRT" card

CHAPTER 2

GENERAL ERROR MESSAGE/DIAGNOSTIC DESCRIPTIONS

There are three error message/diagnostic routines that are pertinent to and useful in each of the six major sections. Described in succeeding pages, these are as follows:

- a. Section card error messages/diagnostics.
- b. Sequence check error messages/diagnostics.
- c. Data subroutine error messages/diagnostics.

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SECTION CARD ERROR
MESSAGES/DIAGNOSTICS

"*** _____ SECTION SHOULD BE NEXT"

An input section has appeared prior to expected point in input deck.

"***ILLEGAL SEQUENCE OPTION"

Check "SECTION" card, Cols 21-28. Only: 1. "SEQCOMNT," 2. "SEQABORT," 3. "SEQIGNOR" are permitted options.

"***SECTION INPUT UNIT OUT OF RANGE"

Input unit has been defined as either less than zero (0) or greater than ninety-nine (99).

SEQUENCE CHECK ERROR
MESSAGES/DIAGNOSTICS

"***ABOVE CARD OUT OF SEQUENCE"

If on the "SECTION" card, the user has requested either "SEQCOMNT" or "SEQABOKT" the above message is generated when a sequence number (Cols 73-80) has been encountered which is not greater than the preceding card's sequence number.

"***IGNORING SEQUENCE ERRORS HEREAFTER FOR THIS SECTION ONLY"

If on the "SECTION" card the user has requested "SEQCOMNT," a maximum of twenty (20) such comments on out of sequence cards will be generated within any one section of the input data.

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DATA SUBROUTINE ERROR
MESSAGES/DIAGNOSTICS

****FROM PACKING ROUTINE - NEGATIVE ARGUMENT"

The subroutine "PAK" cannot accept negative values to be bit packed into an array. Examine core dump and other diagnostic aids to determine how/why negative argument.

****FROM PACKING ROUTINE-FIELD OVERFLOW

The value specified for packing is too large to fit into bit specification for that field.

****ILLEGAL TERRAIN TYPE"

Terrain type not A, B, C, or D.

CHAPTER 3

CEM V REPORTS

3-1. REPORT GENERATOR. The report generator is a program separate from the CEM simulation program. The report generator processes a CEM output file to provide a series of unit tactical reports, Blue battalion engagement frequency reports, FEBA location reports, command and control reports, logistical reports, Blue personnel reports, loss versus cause reports, theater tactical summaries, and air battle summaries. The report generator also writes a Combat Unit Trace file (to logical unit 20), and the Automated Data Display of CEM Outputs (ADDCOP) files (to the following logical units: 18--Blue logistics by partition; 23--summary data and engagement frequencies; 25--FEBA locations; 26--Blue non-partitioned logistics; 27--Red logistics; 28--tactical aircraft data) for use by CEM auxiliary postprocessors.

3-2. UNIT TACTICAL REPORTS

a. The first page of the unit tactical reports, shown in Figure 3-1, gives the reporting cycle (frequency) of several of these reports, as well as the duration of the simulation and of the corp, army, and theater cycles employed in a particular scenario.

b. There are two presentations of data in the unit tactical reports, as displayed in Figures 3-2 and 3-3. The initial presentation is labeled "Division Cycle 0" and gives the initial location, authorized troop strength, supplies, and numbers of major weapons assigned to the combat units, with resolution down to brigade on the Blue side and division on the Red side. The second presentation is illustrated in Figure 3-3 and is reported in each division cycle or every nth division cycle, as specified by gamer input. This presentation includes the location, mission, and status of each combat unit after the engagement assessment and replenishment for that division cycle. The entries in the unit tactical reports are described in detail as follows.

(1) Echelon. The organizational level for each designated component of the theater force. The identifiers "CV" and "CAV" indicate that the location, state, and mission data presented on that line apply to the corps (or division), while other data on the line apply only to the corps (or division) cavalry unit.

INPUT SUMMARY	
CAV. EQUIPMENT INTERCHANGEABILITY **UNCLASSIFIED**	
USER SPECIFICATIONS	
DURATION	
THEATER CYCLES IN GAME	4
ARMY CYCLES PER THEATER CYCLE	2
CORPS CYCLES PER ARMY CYCLE	2
DIVISION CYCLES PER CORPS CYCLE	2
TACTICAL REPORTS	
BLUE AND RED UNIT REPORT EVERY DIVISION CYCLE	
BLUE BATTALION ENGAGEMENT FREQUENCY REPORT EVERY THEATER CYCLE	
END OF COMBAT REPORTS	
THEATER TACTICAL SUMMARY EVERY THEATER CYCLE	
AIR BATTLE SUMMARY EVERY THEATER CYCLE	
FEBA LOCATION REPORTS	
FEBA MAP EVERY DIVISION CYCLE 10 MINISECTORS PER LINE	
FEBA TABLE EVERY DIVISION CYCLE	
LOGISTICAL REPORTS	
COMBAT UNIT LOGISTIC REPORT EVERY DIVISION CYCLE	
THEATER LOGISTIC REPORT EVERY THEATER CYCLE	
COMMAND AND CONTROL REPORTS	

Figure 3-1. Example of CEM Contents Summary

BLUE UNIT REPORT AS OF DIVISION CYCLE 0										
AUTHORIZED RESOURCE LEVEL										
UNIT NAME	ECHOLON	FEDS BAND LOW HIGH	STATE	PERSONNEL	POL (TONS)	ARMO (TONS)	OTHER (TONS)	TANKS	APCS	HELOS
*** BLUE	THEATER	1 400								
*** BLUEHARRY	ARMY	1 400	100							
** FIRST	CORPS CV	1 100	100	2767.00	1620.70	1444.10	300.10	51.00	309.00	87.00
• 1ST ARMD	DIV CAV	1 40	100	785.00	330.80	244.10	171.40	.00	101.00	24.00
/1/	80E	20 40	100	2114.00	530.40	354.30	251.70	108.00	168.00	.00
/2/	80E	20 40	100	2114.00	530.40	354.30	251.70	108.00	168.00	.00
/3/	80E	*RESERVE*	100	1235.00	416.60	281.00	170.70	108.00	94.00	.00
• 1ST MECH	DIV CAV	41 106	100	993.00	427.60	289.00	190.20	.00	101.00	36.00
/1/	80E	41 80	100	2114.00	510.20	344.00	246.60	108.00	158.00	.00
/2/	80E	41 106	100	2114.00	510.20	344.00	246.60	108.00	158.00	.00
/3/	80E	*RESERVE*	100	1812.00	346.60	241.30	199.60	94.00	141.00	.00
• 2ND MECH	DIV CAV	107 180	100	775.00	337.80	244.10	120.60	.00	101.00	29.00
/1/	80E	107 180	100	2062.00	510.20	354.00	246.60	108.00	158.00	.00
/2/	80E	181 180	100	2114.00	530.40	354.30	251.70	108.00	168.00	.00
/3/	80E	*RESERVE*	100	1788.00	346.60	250.00	199.60	94.00	141.00	.00
• 3RD ARMD	DIV CAV	*RESERVE*	100	N / A						
/1/	80E	*RESERVE*	100	2114.00	510.20	344.00	246.60	108.00	158.00	.00
/2/	80E	*RESERVE*	100	2114.00	510.20	344.00	246.60	108.00	158.00	.00
/3/	80E	*RESERVE*	100	1287.00	444.70	275.00	175.60	108.00	100.00	.00
** SECOND	CORPS CV	181 400	100	6309.00	3351.00	2780.40	789.10	102.00	645.00	150.00
• 3RD MECH	DIV CAV	181 240	100	775.00	337.80	244.10	120.60	.00	101.00	29.00
/1/	80E	181 220	100	2062.00	510.20	439.00	246.60	108.00	158.00	.00
/2/	80E	221 240	100	2166.00	546.50	354.70	256.80	108.00	166.00	.00
/3/	80E	*RESERVE*	100	1758.00	346.60	250.00	199.60	94.00	141.00	.00
• 4TH MECH	DIV CAV	241 344	100	939.00	378.10	365.90	134.10	.00	101.00	50.00
/1/	80E	241 300	100	2062.00	510.20	344.00	246.60	108.00	158.00	.00
/2/	80E	301 344	100	2610.00	442.80	310.70	275.80	94.00	203.00	.00
/3/	80E	*RESERVE*	100	2062.00	510.20	284.00	236.60	108.00	158.00	.00

BLUE UNIT REPORT AS OF DIVISION CYCLE 0										
AUTHORIZED RESOURCE LEVEL										
UNIT NAME	ECHOLON	FEDS BAND LOW HIGH	STATE	PERSONNEL	POL (TONS)	ARMO (TONS)	OTHER (TONS)	TANKS	APCS	HELOS
(CONTINUED FROM PRECEDING PAGE)										
• 1ST SPEC	DIV CAV	347 400	100	1440.00	623.80	289.30	149.10	.00	27.00	59.00
/1/	80E	347 368	100	2343.00	22.00	166.70	158.80	.00	.00	.00
/2/	80E	349 400	100	2142.00	30.60	213.10	214.90	.00	.00	.00
/3/	80E	*RESERVE*	100	2675.00	211.60	262.50	207.10	.00	72.00	.00
• 3RD ARMD	DIV CAV	*RESERVE*	100	N / A						
/1/	80E	*RESERVE*	100	1342.00	510.20	354.00	246.60	108.00	158.00	.00
/2/	80E	*RESERVE*	100	2085.00	416.60	261.00	170.40	108.00	94.00	.00
/3/	80E	*RESERVE*	100	2114.00	530.40	354.30	251.70	108.00	162.00	.00
• REINFORCING DIVISION 9				2831.00	1034.10	436.00	282.30	.00	.00	107.00
• REINFORCING BDE 1			80	2676.00	211.70	186.00	187.30	.00	.00	.00
• REINFORCING BDE 2			80	2971.00	23.30	139.60	184.90	.00	.00	.00
• REINFORCING BDE 3			80	2804.00	214.90	200.60	192.30	43.20	63.20	.00
• REINFORCING DIVISION 10				1376.00	658.40	385.60	177.30	.00	101.00	62.00
• REINFORCING BDE 1			87	2116.00	443.80	299.20	214.60	93.94	37.46	.00
• REINFORCING BDE 2			87	2116.00	443.80	299.20	214.60	93.94	37.46	.00
• REINFORCING BDE 3			87	3408.00	318.40	308.10	274.60	46.98	122.67	.00
• REINFORCING DIVISION 11				1210.00	1121.60	407.80	347.70	.00	101.00	126.00
• REINFORCING BDE 1			69	2116.00	382.00	237.30	276.20	74.62	109.02	.00
• REINFORCING BDE 2			69	1236.00	287.40	189.40	117.60	74.62	66.24	.00
• REINFORCING BDE 3			69	1901.00	181.60	146.60	126.50	37.82	94.81	.00
• REINFORCING DIVISION 12				1247.00	491.60	312.60	141.10	.00	32.00	48.00
• REINFORCING BDE 1			69	2701.00	320.70	187.80	152.60	37.24	11.73	.00
• REINFORCING BDE 2			69	2701.00	320.70	187.80	152.60	37.24	11.73	.00
• REINFORCING BDE 3			69	3352.00	76.40	156.70	132.70	.00	43.78	.00
• REINFORCING DIVISION 13				1968.00	723.40	363.70	218.90	.00	32.00	69.00
• REINFORCING BDE 1			60	2149.00	72.20	143.10	180.70	.00	37.20	.00
• REINFORCING BDE 2			60	2149.00	72.20	143.10	180.70	.00	37.20	.00
• REINFORCING BDE 3			60	2701.00	115.80	163.00	132.70	22.40	10.20	.00

Figure 3-2. Time Zero Blue Unit Tactical Report

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Figure 3-3. Sample Page of Red Unit Tactical Report

(2) FEBA Band. Low--the unit's northernmost minisector. High--the unit's southernmost minisector. These boundaries apply to the entire divisions and corps, rather than to the cavalry units. The notation "RESERVE" indicates that the unit was in reserve, rather than employed along the FEBA, for the given cycle.

(3) State. The average state of all on-line and reserve maneuver battalions/regiments included in a given organization. All maneuver battalions in a brigade are considered to be at the same state as the brigade. Brigade state is defined as 100 times the current combat capability of the brigade divided by the brigade's full strength combat capability in a meeting engagement. A brigade's combat capability is the sum of firepower available from all the sources listed in the brigade status file and constrained, where appropriate, by supply shortages. Current status file values, which vary between division cycles, are used to compute a brigade's current combat capability. Full strength (authorized) values, which remain constant throughout a particular simulation, are used to compute a brigade's full strength combat capability. Regiments of those Red divisions in the decimation pool are not included at the corps and army echelons. For Blue, at the division, corps, and army echelons, the average state does not include the state of the maneuver battalions in the cavalry units.

(4) Mission. The mission (attack, defend, delay, or reserve) selected for the particular organization during the given division cycle. The "N/A" notation reflects the fact that a Blue division does not select a division mission, but does assign its subordinate brigades missions.

(5) Personnel. Does not include the crews of tanks, light armor, and helicopters.

(6) Decimated Division

(a) Army. The parent army headquarters from which the Red division was withdrawn for rebuilding. The number of this army headquarters is multiplied by 50 when the division has been deactivated (stripped of its resources).

(b) Cycles. The number of division cycles that a particular Red division has been in the rebuilding pool.

3-3. ENGAGEMENT FREQUENCY REPORTS. The engagement frequency reports give the frequency of occurrence of the nine types of engagement among the Blue combat units. The reporting cycle for these reports is specified on the Report Options Card.

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Engagement type

BAD	Blue attacks; Red delays.
BAPD	Blue attacks; Red defends from prepared positions.
BAHD	Blue attacks; Red defends from hasty positions.
Meeting engagement	Blue attacks, Red attacks.
RAHD	Red attacks; Blue defends from hasty positions.
RAPD	Red attacks; Blue defends from prepared positions.
RAD	Red attacks; Blue delays.
Static	Neither side attacks, i.e., Blue's mission may be either defend or delay while, concurrently, Red's mission is either defend or delay.
Reserve	Blue battalions in brigades assigned a reserve mission.
Blue battalions (all types)	<p>The number of Blue maneuver battalions participating in a given type of engagement during a division cycle, summed for the n corps cycles. (That is, a count of 1 means 1 Bn in that type of engagement for 1 division cycle.) The column figures show the count of such incidents for 2n division cycles. Battalions in cavalry units are not included. The total of this column divided by 2n will equal the average number of maneuver battalions assigned to divisional brigades in the theater force in a division cycle of this theater cycle.</p>

Red divisions/ Blue battalions	Average number of Red divisions faced by each Blue maneuver battalion for each type of engagement during the theater cycle.
Engagement frequency	Fraction of all incidents during the theater cycle that were of the given engagement type. (Sample calculation: For the data shown in Figure 3-4, adding up the "BLUE BNS (ALL TYPES)" column gives a total of 992 incidents of all types; dividing this into the 131.7 incidents of type BAPD gives an engagement frequency of .133 for this engagement type $131.7/992 = .133$).
Cumulative	Columns have the same definitions as presented above except that values are cumulative, i.e., they apply from division cycle 1 through the end of the theater cycle of interest. Thus, "engagement frequency" for the "CUMULATIVE" side of the report is an occurrence profile for the war to date.

3-4. FEBA LOCATION REPORTS

a. The report cycle of the FEBA Location Reports is controlled by input on the Print Option Card. A choice of map representations is available to the gamer by means of an input option. A fixed scale map displaying the entire battlefield (as identified by inputs) may be selected. Or, for better resolution, a variable scale map may be selected in which the scale is automatically adjusted to display only the rectangular area symmetric about the east-west average of the D-day FEBA and extending westward and eastward just far enough to contain the FEBA at the time of the report. The vertical scale of these maps is an input value.

b. Tables presenting the FEBA location for each minisector, and tables showing the distance the FEBA has changed from its original location to the current location for each minisector, can be requested as often as every division cycle. The content of the FEBA Location Reports is described in detail as follows.

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BLUE PARTITION 1		BLUE BN ENGAGEMENT FREQUENCY REPORT AT END OF CORPS CYCLE IS			
		CURRENT CORPS CYCLE		CUMULATIVE	
ENGAGEMENT TYPE	BLUE BNS (ALL TYPES)	RED DIVS/ BLUE BN	ENGAGEMENT FREQUENCY	BLUE BNS (ALL TYPES)	ENGAGEMENT FREQUENCY
1 - BAD	.00	.00	.000	.00	.000
2 - BAPD	.00	.00	.000	.00	.000
3 - BANO	.00	.00	.000	.00	.000
4 - MEETING	.00	.00	.000	.00	.000
5 - RAND	.00	.07	.036	.152.1	.052
6 - RAPD	.17.6	.19	.079	.966.9	.101
7 - RAD	.00	.00	.000	.97.8	.039
8 - STATIC	.108.4	.11	.490	.1390.8	.079
9 - RESERV	.88.0		.396	.798.8	.228

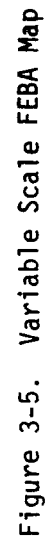
AMMUNITION RATES POSTURE FREQUENCIES		BARTIME REPLACEMENT FACTORS BARTIME POSTURES	
POSTURE	CURRENT DAY	POSTURE	CUMULATIVE
ATTACK	.000	ATTACK	.000
DEFENSE INTENSE	.191	DEFENSE	.115
DELAY	.000	DELAY	.039
DEFENSE LIGHT	.009	INACTIVE	.953

Figure 3-4. Blue Bn Engagement Frequency Report

c. Variable Scale FEBA Map by Division Cycle (Figure 3-5)

Vertical scale	An input value that is measured in minisectors per line. The north-south resolution for representing the FEBA trace is represented by this value; e.g., in the sample, each line of print represents a distance of 10 minisectors.
Horizontal scale	The horizontal scale, expressed in kilometers per column, is automatically varied by the model as the distance between the current FEBA and the original FEBA changes; i.e., as one force proceeds deeper into the opposing force's territory, the horizontal scale becomes smaller (more kilometers per column) to prevent the battlefield from exceeding the sideways limits of the paper.
Average FEBA	Represents the average east-west location coordinate of the FEBA. It is computed by summing the coordinates (in km) for all the minisectors and dividing by the number of minisectors.
Maximum points (Blue and Red)	The easternmost (for Blue) and westernmost (for Red) locations along the FEBA. These represent the maxima for the penetrations of the two sides.
Change from starting average/ FEBA	Differences between the average FEBA location at time zero and the current average FEBA location.

d. Fixed Scale FEBA Map by Division Cycle. This map option provides a fixed map scale so that, for example, the FEBA trace for day 30 can be overlaid directly with the FEBA trace for day 60 for visual comparison. The meaning of the wording below the map is the same as for the variable scale map.



e. FEBA Location Table by Division Cycle (Figure 3-6). This table indicates the FEBA position in kilometers for each minisector. Digits in the minisector number appear horizontally across the top of the table and tens vertically down the left side; the actual minisector number is represented by the intersection of a "tens" row and a "digits" column. (The intersection of the "10" row and the "10" column is the value for minisector 20, etc.) The line above the table, "TIME-/-/-/," indicates the elapsed battle-field time in terms of theater cycle/army cycle/corps cycle/division cycle.

f. FEBA Difference Table by Division Cycle (Figure 3-7). This table shows the (cumulative) change in each minisector's east-west coordinate since time zero. The change is shown in km; a negative sign shows a westward change; no sign (= positive) shows an eastward change.

3-5. LOGISTICAL REPORTS. Three logistic report formats are used to present the consumption and replacement of resources by the combat units. The reports are item oriented in contrast to the unit orientation of the tactical reports.

a. The initial report format is the division cycle logistic report, as shown in Figure 3-8. There is a print frequency option which may be used to have this report printed every division cycle or following the last division cycle of each theater cycle. The latter option results in the total unit losses being summed over each theater cycle instead of giving the single division cycle losses. The cumulative losses are summed from the start of the combat simulation, independent of the division cycle print frequency. The entries in this report are further described as follows.

Theater resources	Listing of maneuver battalion (Red regiment) and cavalry squadron personnel, categories of supply, types of major combat vehicles, and types of ground antitank/mortar weapons. NOTE: Red-side information in these reports does not include the resources of the Red divisions in the "Decimation Pool."
-------------------	---

FLBA LOCATION TABLE
T-1 1J/25/50/100

	0	1	2	3	4	5	6	7	8	9	10
0	637.8	637.8	637.8	637.8	637.8	637.8	637.8	637.8	637.8	637.8	637.8
10	633.7	633.7	633.7	633.7	633.7	633.7	633.7	633.7	633.7	633.7	633.7
20	640.7	640.7	640.7	640.7	640.7	640.7	640.7	640.7	640.7	640.7	640.7
30	665.0	665.0	665.0	665.0	665.0	665.0	665.0	665.0	665.0	665.0	665.0
40	679.9	679.9	679.9	679.9	679.9	679.9	679.9	679.9	679.9	679.9	679.9
50	685.0	685.0	685.0	685.0	685.0	685.0	685.0	685.0	685.0	685.0	685.0
60	704.1	704.1	704.1	704.1	704.1	704.1	704.1	704.1	704.1	704.1	704.1
70	693.3	693.3	693.3	693.3	693.3	693.3	693.3	693.3	693.3	693.3	693.3
80	697.6	697.6	697.6	697.6	697.6	697.6	697.6	697.6	697.6	697.6	697.6
90	701.6	701.6	701.6	701.6	701.6	701.6	701.6	701.6	701.6	701.6	701.6
100	703.5	703.5	703.5	703.5	703.5	703.5	703.5	703.5	703.5	703.5	703.5
110	703.5	703.5	703.5	703.5	703.5	703.5	703.5	703.5	703.5	703.5	703.5
120	710.2	710.2	710.2	710.2	710.2	710.2	710.2	710.2	710.2	710.2	710.2
130	705.2	705.2	705.2	705.2	705.2	705.2	705.2	705.2	705.2	705.2	705.2
140	695.4	695.4	695.4	695.4	695.4	695.4	695.4	695.4	695.4	695.4	695.4
150	691.0	691.0	691.0	691.0	691.0	691.0	691.0	691.0	691.0	691.0	691.0
160	691.7	691.7	691.7	691.7	691.7	691.7	691.7	691.7	691.7	691.7	691.7
170	690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5
180	688.1	688.1	688.1	688.1	688.1	688.1	688.1	688.1	688.1	688.1	688.1
190	691.0	691.0	691.0	691.0	691.0	691.0	691.0	691.0	691.0	691.0	691.0
200	691.7	691.7	691.7	691.7	691.7	691.7	691.7	691.7	691.7	691.7	691.7
210	681.7	681.7	681.7	681.7	681.7	681.7	681.7	681.7	681.7	681.7	681.7
220	677.1	677.1	677.1	677.1	677.1	677.1	677.1	677.1	677.1	677.1	677.1
230	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8
240	671.9	671.9	671.9	671.9	671.9	671.9	671.9	671.9	671.9	671.9	671.9
250	670.8	670.8	670.8	670.8	670.8	670.8	670.8	670.8	670.8	670.8	670.8
260	670.8	670.8	670.8	670.8	670.8	670.8	670.8	670.8	670.8	670.8	670.8
270	675.5	675.5	675.5	675.5	675.5	675.5	675.5	675.5	675.5	675.5	675.5

Figure 3-6. FEBA Location Table

FEBA DIFFERENCE TABLE
TIME 13/25/50/100

	1	2	3	4	5	6	7	8	9	10
0	-82.3	-82.3	-82.3	-82.3	-82.3	-82.3	-82.3	-82.3	-82.3	-82.3
10	-86.4	-86.4	-86.4	-86.4	-86.4	-86.4	-86.4	-86.4	-86.4	-86.4
20	-79.4	-79.4	-79.4	-79.4	-79.4	-79.4	-79.4	-79.4	-79.4	-79.4
30	-55.1	-55.1	-55.1	-55.1	-55.1	-55.1	-55.1	-55.1	-55.1	-55.1
40	-40.2	-40.2	-40.2	-40.2	-40.2	-40.2	-40.2	-40.2	-40.2	-40.2
50	-35.1	-35.1	-35.1	-35.1	-35.1	-35.1	-35.1	-35.1	-35.1	-35.1
60	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0
70	-26.6	-26.6	-26.6	-26.6	-26.6	-26.6	-26.6	-26.6	-26.6	-26.6
80	-22.5	-22.5	-22.5	-22.5	-22.5	-22.5	-22.5	-22.5	-22.5	-22.5
90	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5
100	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6
110	-10.6	-10.6	-10.6	-10.6	-10.6	-10.6	-10.6	-10.6	-10.6	-10.6
120	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9
130	-14.9	-14.9	-14.9	-14.9	-14.9	-14.9	-14.9	-14.9	-14.9	-14.9
140	-24.7	-24.7	-24.7	-24.7	-24.7	-24.7	-24.7	-24.7	-24.7	-24.7
150	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1
160	-26.4	-26.4	-26.4	-26.4	-26.4	-26.4	-26.4	-26.4	-26.4	-26.4
170	-29.6	-29.6	-29.6	-29.6	-29.6	-29.6	-29.6	-29.6	-29.6	-29.6
180	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0
190	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1
200	-28.4	-28.4	-28.4	-28.4	-28.4	-28.4	-28.4	-28.4	-28.4	-28.4
210	-38.4	-38.4	-38.4	-38.4	-38.4	-38.4	-38.4	-38.4	-38.4	-38.4
220	-43.0	-43.0	-43.0	-43.0	-43.0	-43.0	-43.0	-43.0	-43.0	-43.0
230	-47.3	-47.3	-47.3	-47.3	-47.3	-47.3	-47.3	-47.3	-47.3	-47.3
240	-48.2	-48.2	-48.2	-48.2	-48.2	-48.2	-48.2	-48.2	-48.2	-48.2
250	-49.3	-49.3	-49.3	-49.3	-49.3	-49.3	-49.3	-49.3	-49.3	-49.3
260	-49.3	-49.3	-49.3	-49.3	-49.3	-49.3	-49.3	-49.3	-49.3	-49.3
270	-44.6	-44.6	-44.6	-44.6	-44.6	-44.6	-44.6	-44.6	-44.6	-44.6

* VALUE SHOWN AT EACH MINISECTOR IS THE DIFFERENCE IN KILOMETERS
BETWEEN ITS CURRENT VALUE AND ITS STARTING VALUE

SIGN CONVENTION - INDICATES A WESTWARD CHANGE * INDICATES AN EASTWARD CHANGE

Figure 3-7. FEBA Difference Table

AD-A081 954

ARMY CONCEPTS ANALYSIS AGENCY BETHESDA MD
CONCEPTS EVALUATION MODEL V (CEM V). PART III. USER'S HANDBOOK, (U)
FEB 80 P E LOUER, R E JOHNSON

F/6 15/7

UNCLASSIFIED

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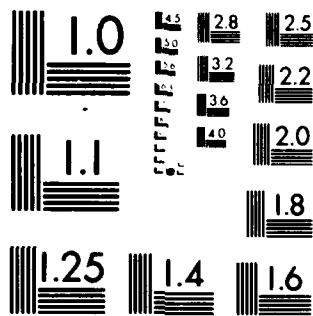
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

ITEM	COMBAT UNIT SUMMARY									
	ALL UNITS AT END OF DIVISION CYCLE 80									
	COMBAT UNIT STATUS AFTER RESUPPLY					COMBAT UNIT SUPPORT BEFORE RESUPPLY				
INTEGRATED RESOURCES	AUTHORITY	ON HAND	PERCENT	PLN	UNIT	AVAILABLE	REQUIRE	CLINT	PLN	TOTAL
PERSONAL	198746.9	42025.3	31.6	0.0	198746.9	42025.3	31.6	0.0	198746.9	42025.3
1	198746.9	42025.3	31.6	0.0	198746.9	42025.3	31.6	0.0	198746.9	42025.3
POL	120425.1	130309.2	99.9	0.0	120425.1	130309.2	99.9	0.0	120425.1	130309.2
1	120425.1	130309.2	99.9	0.0	120425.1	130309.2	99.9	0.0	120425.1	130309.2
AMMO	50247.0	50227.0	100.0	0.0	50247.0	50227.0	100.0	0.0	50247.0	50227.0
1	50247.0	50227.0	100.0	0.0	50247.0	50227.0	100.0	0.0	50247.0	50227.0
TRNS 2	820.0	940.5	58.0	0.0	820.0	940.5	58.0	0.0	820.0	940.5
TRNS 3	2396.0	30.9	1.3	0.0	2396.0	30.9	1.3	0.0	2396.0	30.9
TRNS 4	270.0	2.4	0.9	0.0	270.0	2.4	0.9	0.0	270.0	2.4
TRNS 5	1797.0	71.9	4.0	0.0	1797.0	71.9	4.0	0.0	1797.0	71.9
TRNSUM	5241.0	585.6	11.2	0.0	5241.0	585.6	11.2	0.0	5241.0	585.6
APCS 1	972.0	729.0	75.0	0.0	972.0	729.0	75.0	0.0	972.0	729.0
APCS 2	8679.0	4317.0	76.0	0.0	8679.0	4317.0	76.0	0.0	8679.0	4317.0
APCS 3	2480.0	1796.0	72.5	0.0	2480.0	1796.0	72.5	0.0	2480.0	1796.0
APCSUM	9131.0	6842.9	74.9	0.0	9131.0	6842.9	74.9	0.0	9131.0	6842.9
HELO 1	816.0	173.3	21.2	0.0	816.0	173.3	21.2	0.0	816.0	173.3
HELO 9	11.0	6.8	61.5	0.0	11.0	6.8	61.5	0.0	11.0	6.8
HELO 5	199.0	38.3	24.5	0.0	199.0	38.3	24.5	0.0	199.0	38.3
HELOSUM	971.0	218.4	22.2	0.0	971.0	218.4	22.2	0.0	971.0	218.4

Figure 3-8. Example of Division Cycle Logistic Report

Combat unit status
after resupply

Authorized: Resources authorized for the units in the force when they are at full strength. NOTE: The personnel entry includes both crew members for major vehicles (tanks, APCs, and helicopters) and noncrew personnel.

On-hand: Number, or quantity, of each status file item in theater at end of the division cycle after the unit has been resupplied.

Percent: The ratio of on-hand to authorized.

(a) For Blue: The amount of a resource on hand after resupply is calculated thus:

$$M(N) = M(N-1) + \text{Min}(P(N), Q(N)) - S(N)$$

Where:

M(N) is resource on hand at end of current cycle after that cycle's resupply.

M(N-1) is amount on hand at end of the previous cycle

P is resource quantities available

Q is resource quantities required before resupply

S is resources lost during the cycle

(b) For Red: If Red uses the decimation pool method of resupply, the relationship in (a) above applies only for POL, ammo, and other. Personnel and weapons systems are resupplied only to divisions in the decimation pool.

Combat unit
support before
resupply

Available: Number of personnel, tons of supplies or quantity of weapons in the appropriate theater distribution pool.

Required: Resources needed by combat units before the resupply for that division cycle occurs (i.e., before the status file entries are incremented.) Personnel are in units of persons, supplies in tons, and weapon systems in weapons.

(a) Personnel Replacement - Both Blue and Red: The personnel actually available for assignment to combat units can be restricted by an assimilation delay. (This delay is specified in the data deck.) When a delay is specified, a "cleared for assimilation" pool (not shown) is created and the number of men added during resupply is the minimum of required men (Col. Q) or men in the "cleared for assimilation" pool.

(b) Amount Required - Both Blue and Red: The amount of a resource required in a given cycle before that cycle's resupply is calculated thus:

$$Q(N) = L(N-1) - M(N-1) + S(N)$$

Where:

Q(N) is the amount required
(L(N-1)-M(N-1)) is the difference between the previous cycle's authorized and on-hand amounts.

S(N) is the amount of resource lost during the current cycle.

This relationship is valid for Red because the authorized and on-hand values are calculated by aggregating status files, not including the status files of units in the decimation pool.

Total unit losses The total amount of a resource "lost," both temporarily and permanently, due to both combat and noncombat causes during a given cycle. The term "losses" as used in these reports includes only those that decrement the status of the appropriate units.

Cumulative combat (a) Combat:

Unit losses 1. Temp - For personnel, the value given represents the total number of wounded, not requiring evacuation, who have entered a theater hospital for treatment since D-day. The "TEMP" column shows zero values for POL, ammo, and other because there is no "temporary" damage of them. For weapons systems other than AT/M the values shown are "total damaged, retrieved, and sent into theater shops since D-day." For AT/M, all equipment damage is permanent.

2. Perm: These values mean "permanently gone from the theater." The personnel figure is the sum of KIA, CMIA, and those WIA who have been evacuated from theater since D-day. The supply figures are the total tonnages consumed by on-line units since D-day. The equipment values are the sums of destroyed and "damaged/not recovered" since D-day.

(b) Noncombat

1. Temp - For personnel, the value given is the total number of casualties due to disease and nonbattle injuries (DNBI) who have entered a theater hospital for medical treatment since D-day. Supplies and AT/M weapons have no temporary losses. For equipment, other than AT/M weapons, the value represents the total number of breakdowns due to mechanical failure, since D-day, which are repairable. Only personnel who are not crew members of major combat vehicles are victims of DNBI factors.

2. Perm - The personnel value represents the number of casualties due to DNBI who have been evacuated from the theater or who have died since D-day. For supplies, the values represent the total tonnage consumed by units in reserve during the division cycle since D-day. The equipment value represents the total quantity of equipment, with the exception of AT/M weapons, which is abandoned after experiencing mechanical failure. There are no noncombat losses of AT/M weapons.

(c) Total: The total amount of a resource "lost," both temporarily and permanently, due to both combat and noncombat causes since D-day. For supplies, the total consumption of on-line and reserve units.

b. The theater cycle logistic report is a summary of the logistic status and resource flow during the theater cycle. As illustrated in Figure 3-9, it presents an accounting of resources on-hand at the end of the cycle, losses sustained, flow of resources through the theater, and receipt of resources from out of theater. This presentation does not include the resources of the Red divisions in the decimation pool. The entries in this report are described as follows:

Theater
resources

Listing of types of resource in all cavalry
squadrons and maneuver units.

Resources on-hand

(a) COMBAT UNITS:

Personnel - Total number of personnel
in theater force's cavalry squadrons and
maneuver units at end of the theater cycle.

Supplies - Total tonnage of supplies in force's
cavalry squadrons and maneuver units.

Equipment - Total quantity of equipment by
type in force's cavalry squadrons and maneuver
units.

(b) THEATER STOCKS:

Personnel - Total number in theater replacement pool.

Supplies - Total tonnage in theater supply
system.

Equipment - Total number of items in theater
major item pool available for issue to maneuver
units/cavalry squadrons.

(c) IN REPAIR:

Personnel - Number in theater hospitals
for in-theater medical care.

Equipment - Number of items in theater
maintenance system for repair and return to
theater combat units.

JAW FORCE THEATERWIDE LOGISTIC SUMMARY										AT END OF INTERIM CYCLE 2									
THEATER RESOURCES	COMBAT UNITS	COMBAT STOCKS	IN REPAIR	TOTAL	TEMP COMBAT	TEMP NONCOMBAT	TOTAL COMBAT	TOTAL NONCOMBAT	GAINS TO INTEGRATED STOCKS	GAINS TO INTEGRATED STOCKS	GAINS TO INTEGRATED STOCKS	GAINS TO INTEGRATED STOCKS	GAINS TO INTEGRATED STOCKS	GAINS TO INTEGRATED STOCKS	GAINS TO INTEGRATED STOCKS	GAINS TO INTEGRATED STOCKS	GAINS TO INTEGRATED STOCKS	GAINS TO INTEGRATED STOCKS	GAINS TO INTEGRATED STOCKS
25000	34670	01990	730	25071	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
1	01920	2	2027	9491	0	9491	9491	9491	9491	9491	9491	9491	9491	9491	9491	9491	9491	9491	9491
2	199570	3	9996300	10099	0	10099	10099	10099	10099	10099	10099	10099	10099	10099	10099	10099	10099	10099	10099
3	125199	3	9996500	10320	0	10320	10320	10320	10320	10320	10320	10320	10320	10320	10320	10320	10320	10320	10320
4	33007	1	1534780	0	1534780	1534780	1534780	1534780	1534780	1534780	1534780	1534780	1534780	1534780	1534780	1534780	1534780	1534780	1534780
5	05533	3	1920230	0	1103700	1103700	1103700	1103700	1103700	1103700	1103700	1103700	1103700	1103700	1103700	1103700	1103700	1103700	1103700
6	127403	0	720200	0	740990	740990	740990	740990	740990	740990	740990	740990	740990	740990	740990	740990	740990	740990	740990
7	195030	2	702010	0	712100	712100	712100	712100	712100	712100	712100	712100	712100	712100	712100	712100	712100	712100	712100
8	05500	0	00000	0	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
9	25203	1	11000	0	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000
10	05200	2	0	0	15200	15200	15200	15200	15200	15200	15200	15200	15200	15200	15200	15200	15200	15200	15200
11	20035	7	0	0	20035	20035	20035	20035	20035	20035	20035	20035	20035	20035	20035	20035	20035	20035	20035
12	1000	1	0	7077	23023	900	900	900	900	900	900	900	900	900	900	900	900	900	900
13	200	0	0	1200	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
14	3307	0	0	7001	9000	1701	2002	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300
15	010	0	0	1070	0	300	470	300	300	300	300	300	300	300	300	300	300	300	300
16	000	0	0	1000	0	200	200	200	200	200	200	200	200	200	200	200	200	200	200
17	000	0	0	1000	0	200	200	200	200	200	200	200	200	200	200	200	200	200	200

Figure 3-9. Example of Theater Cycle Logistic Report

(d) TOTAL: Total number/quantity on hand in theater. Sum of the items in combat units plus those in theater stocks plus those in repair. This total may also be computed as:

$$X(N) = X(N-1) - E(N) - G(N) + H(N)$$

Where:

$X(N)$ is the total on hand in theater at end of current cycle

$X(N-1)$ is the total on hand for the previous theater cycle

$E(N)$ is permanent loss due to combat

$G(N)$ is permanent loss due to noncombat factors

$H(N)$ is gains to theater stocks from external sources.

Losses to combat
units

(a) COMBAT:

1. Temp:

Personnel - Total number of wounded, not requiring evacuation, who enter a theater hospital for treatment during the given theater cycle.

Supplies - No temporary losses

Equipment (other than AT/M weapons) - The total number damaged, retrieved, and transferred to a theater maintenance facility during the given theater cycle. (Not applicable to AT/M weapons).

2. Perm:

Personnel - The sum of KIA and CMIA, plus those wounded who were evacuated from the theater during the given theater cycle.

Supplies - Total tonnage consumed during the theater cycle by units while they were on line.

Equipment - Total number destroyed and damaged but not retrieved during the cycle.

(b) NONCOMBAT:

1. Temp:

Personnel - Total number of casualties due to DNBI who entered a theater hospital for medical treatment during the cycle.

Supplies - No temporary losses.

Equipment - (Other than AT/M weapons). Total number of breakdowns due to mechanical failure during the cycle. (Not applicable to AT/M weapons).

2. Perm:

Personnel - Total number evacuated from the theater or dead during the given theater cycle.

Supplies - Total tonnage consumed during the cycle by units while they were in reserve.

Equipment (Other than AT/M weapons) - Total quantity for a given cycle, which are abandoned after experiencing mechanical failure.

AT/M weapons - No noncombat losses.

(c) TOTAL: The total amount of resources "lost," both temporarily and permanently, due to both combat and noncombat causes in a given theater cycle.

Gains to theater
stocks

(a) FROM SUPPLY:

Total number/quantity of resources received by the appropriate theater distribution pool, during the given cycle, from sources outside the theater, e.g., CONUS.

(b) FROM REPAIRS:

Personnel - Total number of personnel transferred to the theater replacement pool from theater hospitals during the given theater cycle.

Supplies - N/A

Equipment - Total quantity forwarded to the theater major item distribution pool from theater maintenance facilities (AT/M weapons are not repaired).

Gains to unit

Total number/tonnage received by all Blue cavalry squadrons and maneuver units in the theater force during the given theater cycle. For Red, when the model is operated with a "Decimation Pool," the totals reflect the number of personnel and quantities of equipment received by Red divisions in the decimation pool. However, the totals for supplies represent tonnages distributed to all Red divisions in the theater. This difference is because the model sends personnel and equipment only to the "decimation pool" when using that method of unit rebuild; it continues, however, to send supplies to all Red divisions in theater.

c. The report of logistic experience by major item type (Figure 3-10) is produced only once, at the end of the simulation. It includes a separate presentation for personnel, for each category of supply, and for each item of equipment for each side.

3-6. COMMAND AND CONTROL REPORTS. The command and control reports provide the data used in making army and corps decisions as to unit mission assignments and force relocations or reorganizations. A decision report is produced for each army simulation cycle and each corps simulation cycle. The entries in these reports are described as follows.

3-23

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a. Army Decision Summary (Figure 3-11)

Army name	Designation of each theater organization above corps echelon at which certain decisions are made every army cycle. For Red, the designations are for fronts, which will contain two to five Red armies. Decisions made every army cycle include: allocation of fire support (both GS artillery battalions and close air support (CAS) sorties), commitment or reconstitution of a reserve, assignment of arriving reinforcement divisions and (for Red) assignment of reinforcement divisions released from the "decimation pool."
Frontage	Defines the Army/Front sector of responsibility in terms of minisectors.
Mission	The mission (attack, defend, delay) selected by the Army (Red Front) for the next army cycle. Mission selection influences other Army decisions, i.e., distribution of corps artillery assets, CAS sortie allocation, army reserve commitment, and assignment of reinforcing divisions.
Friendly FP	Total meeting engagement IFP of friendly Army (Red Front) units considered in the Army estimate of the situation. The meeting engagement IFPs of all units in subordinate corps that are capable (i.e., the unit state exceeds the mission threshold) of undertaking the mission indicated in the "mission" column are aggregated to arrive at the total. The IFP contributed to this total by each Blue brigade (Red division) is modified by the respective unit's current state.

ARMY DECISION SUMMARY						
ARMY CYCLE 7						
ARMY NAME	FRONTAGE	MISSION	FRIENDLY FP	ESTIM. ENEMY FP	FORCE RATIO	REMARKS
SIDE BLUE						
ARMY001	1 - 300	DEFEND	642.04	1108.75	.590	
ARMY002	301 - 660	DEFEND	1032.33	1392.63	.741	
SIDE RED						
ARMY003	1 - 197	ATTACK	459.29	439.03	1.046	
ARMY004	198 - 971	ATTACK	1059.33	910.16	1.164	
ARMY005	972 - 660	ATTACK	950.99	615.69	.748	

Figure 3-11. Example of Army Decision Summary

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Estim
enemy FP

Total meeting engagement IFP estimated for enemy units considered in the Army estimate of the situation. Units on the enemy side that are in on-line divisions facing the Army that are capable of undertaking the complementary mission* (e.g., if friendly mission = defend, then complementary enemy mission is attack) are estimated, and their IFPs are added to the IFPs of enemy artillery battalions estimated to be facing the Army. Brigade (Red division) IFPs are modified by their respective estimated unit states.

*"Capable" means that the unit's state exceeds the threshold state required for that (complementary) mission.

Force ratio

The force ratio is computed by dividing "friendly FP" by "estim enemy FP." The value for the force ratio is compared to input thresholds to determine which mission the army will undertake for the next army cycle.

Remarks

Any decision concerning a reserve corps will appear here.

b. Corps Decision Summary

Corps name

Designation of each Blue corps or Red Army at which certain decisions are made every corps cycle. Decisions made every corps cycle include: Allocation of GS artillery, corps cavalry, and CAS sorties to divisions; reserve commitment or reconstitution; and (for Red) the transfer of decimated divisions to the decimation pool.

Frontage

Defines the corps (Red Army) sector of responsibility in terms of minisectors.

Mission

The mission (attack, defend, delay, reserve) selected by the corps (Red Army) for the next corps cycle. Mission selection influences the other corps decisions described above.

Friendly FP	Total meeting engagement IFP of friendly corps (Red Army) units considered in the corps estimate of the situation. All units that are in subordinate divisions capable (i.e., the unit state exceeds the mission threshold) of undertaking the mission indicated in the "mission" column are identified, and their meeting engagement IFPs, modified by each unit's state, are added to the IFPs of all corps cavalry units and organic division artillery battalions.
Estim enemy FP	Total meeting engagement IFP estimated for enemy units considered in the corps estimate of the situation. Units on the enemy side that are in line divisions facing the corps and capable (i.e., the unit state exceeds the mission threshold) of undertaking the complementary mission are considered, and their IFPs (modified by their estimated state values) are added to the IFPs of all artillery battalions estimated to be facing the corps.
Force ratio	The force ratio is computed by dividing "friendly FP" by "estim enemy FP." The value for the force ratio is compared to input thresholds to determine which mission the corps will undertake for the next corps cycle.
Remarks	Any decision concerning a reserve division will appear here.

3-7. LOSSES/CAUSE REPORT (Figure 3-12)

- a. Physical Organization. The losses/cause report is arranged thus:
- o A page is printed for each day of the war showing, for both sides, the day's losses in each category of equipment. The day's total losses for each category are subdivided into the components caused by each opponent category.
 - o Every tenth day, two 10-day-slice displays are printed. They are the average daily occurrences for that 10-day-slice, and the total occurrences during that 10-day-slice.

DAILY COMBAT MANAGER (FORM 1 TEMP) VS CAUSE TABLE									

LOSSES DURING DAY 1									

BLVE CATEGORY	NAME	APCS	REG	LOSSES OF SIZE	BLVE	CAUSE	CAUSE	CAUSE	TOTAL
LOST			AT/M	CATEGORY	CAUSING LOSS	ARTY			

TANKS (PERM)	972.32	49.02	24.16	00.00	.00	00.00	00.00	00.00	00.00
(TEMP)	304.25	109.10	30.10	102.02	.00	27.02	27.02	27.02	707.00
APC (PERM)	110.22	92.02	7.49	50.20	.00	22.20	22.20	22.20	200.79
(TEMP)	270.00	93.70	42.01	34.00	.00	26.00	26.00	26.00	1819.35
AT/M	1.30	.97	50.02	.00	220.30	9.24	9.24	9.24	2305.10
PERSONNEL (INCLUDES AIO STATION & NOT.0.0.0)									
CHAS	2024.99	400.74	101.06	773.12	.00	102.00	102.00	102.00	3021.00
HELICOPTERS									07.24
MONITOR	19.32	14.00	777.07	.00	3000.10	07.00	07.00	07.00	3021.24
ARTILLERY	.00	.00	.00	.00	.00	.00	.00	.00	.00
HELICO									30.24

BLVE CATEGORY	NAME	APCS	REG	LOSSES OF SIZE	BLVE	CAUSE	CAUSE	CAUSE	TOTAL
LOST			AT/M	CATEGORY	CAUSING LOSS	ARTY			

TANKS (PERM)	1024.00	42.30	201.00	244.00	29.31	230.00	230.00	230.00	1007.00
(TEMP)	005.07	00.10	410.03	100.10	00.02	100.70	100.70	100.70	1003.00
APC (PERM)	230.01	95.37	127.06	190.02	44.34	00.00	00.00	00.00	459.42
(TEMP)	021.02	100.20	317.01	300.00	120.70	39.24	39.24	39.24	1202.35
AT/M	.00	.00	21.79	.00	110.41	1.24	1.24	1.24	191.02
PERSONNEL (INCLUDES AIO STATION & NOT.0.0.0)									
CHAS	3900.07	300.00	190.00	100.70	400.00	300.00	300.00	300.00	3000.00
HELICOPTERS									110.70
MONITOR	.00	.00	420.70	.00	2300.10	300.00	300.00	300.00	2000.70
ARTILLERY	.00	.00	.00	.00	.00	.00	.00	.00	.00
HELICO									100.70

Figure 3-12. Example of Losses/Cause Report

- o Every thirtieth day, two 30-day-slice displays are printed. They are the daily averages for, and total occurrences during, that 30-day period.
- o At the end of the war, two end-of-war displays are printed to show the daily averages and the totals for the entire war.

b. Page Layout. All the displays are laid out thus:

- o The top half of each page shows the Blue side's categories of equipment lost (named on the left side) versus the Red categories of equipment causing the Blue losses. The "TOTALS" column at the far right is the total Blue loss of the categories named on the left from all Red causes.
- o The bottom half of each page shows the Red side's losses of equipment categories versus the Blue categories causing them; it is laid out in the analogous manner to the top half of the page.

3-8. BLUE PERSONNEL DETAIL REPORT. The Blue personnel detail report (Figure 3-13) presents a detailed accounting of Blue personnel casualties, by national partition. The losses are broken out into the categories: killed in action, wounded in action, captured/missing in action, dead, and sick. The casualties are also divided among: those treated at aid stations and returned to duty, those treated at hospitals in theater, those evacuated from theater for treatment, and the dead. For every day (two division cycles) of the simulation, this breakout of casualties is reported on one line, followed by a line presenting the cumulative casualties since D-day. After the last daily report, the daily mean values are reported.

3-9. END OF COMBAT REPORTS. Three tactical activity summary reports are produced after the completion of the combat simulation: the Theater Summary, the Air Battle Summary, and the Sensitivity Analysis Indicators Report. These are described as follows.

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Figure 3-13. Example of Blue Personnel Detail Report

a. Theater Summary (Figure 3-14)

Theater cycle (end of)	Theater period for which the line of data is applicable.
Kilometer change in mean FEBA	Distance (in kilometers) mean theater FEBA moved. Distance represents the value of the ratio of the sum of the FEBA changes in all of the minisectors for a given theater cycle to the total number of minisectors in the theater. A negative number indicates a Red advance (i.e., a westward movement of the mean FEBA).
Cum disp mean FEBA	Change in the coordinate value of the mean FEBA since the beginning of the war (as of the end of the current theater cycle).
Avg state all	Average state of all on-line and reserve maneuver battalions in the force. (Cavalry squadrons, artillery battalions, and support units are not included, nor are battalions in Red decimated divisions).
Divisions in theater	Total number of divisions employed in theater.
Divisions decimated (Red)	Number of Red divisions in "Decimation Pool" for replacement of personnel and major weapons.
GS arty in theater	Number of nondivisional artillery battalions in the force.
CAS squadrons in theater	Number of squadrons of tactical aircraft that are assigned to CAS role in theater.
Arty ammo expended (tons) period cum	Total tons of artillery rounds expended by artillery battalions in DS and GS roles during the theater cycle (PERIOD) and for the war through the end of the current theater cycle (CUM).

THEATER SUMMARY									
INDICATOR CYCLE (END OF)	KILOMETER CHANGE IN MEAN PERIOD	MEAN PERIOD (HRS)	STATE ALL	AVG STATE	DIVISIONS IN THEATER	ALLOCATION IN THEATER	AS APY IN THEATER	AS APY IN THEATER	AS APY IN THEATER
1	-0.3	-0.3	BLUE RED	96	0	0	0	17	3726
2	-0.3	-10.0	BLUE RED	92	0	0	0	10	125361
3	-0.9	-19.1	BLUE RED	77	0	0	0	5	3063
4	-0.0	-20.0	BLUE RED	94	0	0	0	21	120090
5	0.1	-17.0	BLUE RED	91	0	0	0	10	10099
6	3.0	-10.0	BLUE RED	96	0	0	0	22	10012
7	0.0	-0.7	BLUE RED	70	0	0	0	10	10099
8	0.0	-0.2	BLUE RED	70	0	0	0	10	10099
9	-0.0	-11.2	BLUE RED	70	0	0	0	10	10099
10	-0.0	-13.3	BLUE RED	71	0	0	0	10	10099
11	-0.1	-10.0	BLUE RED	72	0	0	0	10	10099
12	-0.0	-17.0	BLUE RED	70	0	0	0	10	10099
13	-0.3	-10.3	BLUE RED	70	0	0	0	10	10099
14	-0.3	-10.0	BLUE RED	70	0	0	0	10	10099
15	-0.3	-10.0	BLUE RED	70	0	0	0	10	10099
16	-0.3	-10.0	BLUE RED	70	0	0	0	10	10099
17	-0.3	-10.0	BLUE RED	70	0	0	0	10	10099
18	-0.3	-10.0	BLUE RED	70	0	0	0	10	10099
19	-0.3	-10.0	BLUE RED	70	0	0	0	10	10099
20	-0.3	-10.0	BLUE RED	70	0	0	0	10	10099

Figure 3-14. Example of Theater Summary

C

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b. Air Battle Summary (Figure 3-15)

Report at end of theater cycle	Theater cycle number. Data applies to conditions existing at end of each cycle listed.
TAC fighters on primary/sanctuary	Sum of tactical aircraft assigned to AR/I, CA, and CAS roles that are stationed at primary or sanctuary bases.
Air defense fighters	Quantity of air defense fighter aircraft assigned in theater.
PCT aircraft asngd by mission AR/I CA CAS	Percentage of tactical (TAC) aircraft, i.e., the total of those stationed at both primary and sanctuary bases, assigned to the indicated roles.
AC destroyed at primary period game	Quantity of aircraft stationed at a primary base which are destroyed on the ground (NOTE: aircraft stationed at a sanctuary base, by definition, are not subject to damage or destruction on the ground due to enemy attack.) Data is given for each theater cycle (period) and cumulatively for the game thus far.
Total AC destroyed period game	Total number of tactical aircraft destroyed in theater by enemy air and enemy ground air defense actions for each theater cycle (period) and cumulative (game).
Total TAC fighters (primary/sanctuary)	Sum of two "TAC FIGHTERS ON" columns.
Aircraft in theater	Number of tactical aircraft in armed reconnaissance/interdiction (AR/I), air defense interceptor (ADI), counterair (CA), and CAS roles.

AIR BATTLE SUMMARY													
REPORT AT END OF BATTLE	SIDE	TAC FIGHTERS		AIR SERVICES FIGHTERS	PERCENTAGE OF TOTAL AC			AC DESTROYED AT BATTLE		TOTAL AC DESTROYED		TOTAL TAC FIGHTERS	
		PRIMARY	SANCTUARY		AC	CA	CAS	PERCENT	AC	PERCENT	AC	PERCENT	AC
1	BLUE	500	0	250	25	00	25	01	01	120	120	500	500
	RED	500	0	250	10	05	17	04	04	170	170	500	500
2	BLUE	500	0	250	25	04	19	08	12	102	250	500	500
	RED	500	0	250	13	01	06	03	10	107	250	500	500
3	BLUE	510	0	220	28	14	04	34	14	70	310	510	510
	RED	520	0	280	13	01	06	01	20	70	310	510	510
4	BLUE	505	0	280	28	04	04	35	20	70	350	505	505
	RED	500	0	300	13	01	06	01	20	60	350	500	500
5	BLUE	510	0	190	28	04	04	32	22	64	400	510	510
	RED	510	0	330	13	01	06	01	20	70	370	510	510
6	BLUE	520	0	170	28	04	04	29	20	57	380	520	520
	RED	505	0	305	13	01	06	01	20	60	380	505	505
7	BLUE	500	0	100	28	04	04	27	20	50	350	500	500
	RED	500	0	270	13	01	06	01	20	50	350	500	500
8	BLUE	510	0	100	28	04	04	26	20	50	350	510	510
	RED	510	0	200	13	01	06	01	20	50	350	510	510

Figure 3-15. Example of Air Battle Summary

c. Sensitivity Analysis Indicators Report (Figure 3-16). In addition to some of the information presented in the Theater Summary, the Sensitivity Analysis Indicators Report gives, for the end of each theater cycle, the ratio of Blue average state to Red average state, the cumulative permanent losses of Blue tanks and of Red tanks, the ratio of Blue permanent tank losses divided by Red permanent tank losses, the number of Blue personnel dead during the theater cycle, the cumulative Blue dead since D-day, and the number of Red divisions in the decimation pool at the end of the theater cycle.

3-10. SIMULATION PROGRESS REPORT. In addition to the reports produced by the CEM Report Generator, there is a report produced by the CEM program while the simulation is in progress.

a. This report details the operation of the Blue weak on-line division replacement logic. Every division cycle, the divisions in each Blue army reserve pool, and their states, are listed, as well as the weak on-line divisions subordinate to each Blue army headquarters and their states. When a decision is made about exchanging a division in an army reserve pool with a candidate weak on-line division, the strengths of the two divisions are reported in detail.

b. Every division cycle the cumulative artillery ammunition expended since D-day by each Blue artillery tube type appears in the Simulation Progress Report. This data is used by a special postprocessor to produce the Artillery Tube Use Report.

c. If the firepower of any artillery battalions or maneuver units has been reduced due to shortages of personnel, ammunition, or supplies, a "rationing" report is included in the Simulation Progress Report, tabulating the number of occurrences of these shortages in the division cycle by engagement type (and by national partition on the Blue side).

c. Every 20 division cycles the Simulation Progress Report gives an accounting of the Blue maneuver battalion ammunition expended, by type of weapon, since D-day.

d. Also every 20 division cycles a detailed accounting of Blue personnel combat losses appears in the Simulation Progress Report. This breaks out the Blue combat casualties between dead and wounded, and among noncrew personnel and crews of each type of tank, light armor, and helicopter.

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Figure 3-16. Example of Sensitivity Analysis Indicators Report

e. The Simulation Progress Report also contains a line every 20 division cycles reporting the numbers of repairable tanks and light armor abandoned on the battlefield since D-day due to adverse FEBA movement.

f. Finally, every 20 division cycles the Simulation Progress Report includes an Outcome Force Ratio Table, which displays, by engagement type, the cumulative number of occurrences, since D-day, of engagement outcome attacker-to-defender force ratios within each of the intervals:

(0.0, 0.5), (0.5, 1.0), (1.0, 1.5), (1.5, 2.0), (2.0, 2.5),
(2.5, 3.0), (3.0, 3.5), (3.5, 4.0), (4.0, 4.5), (4.5, 5.0)
(5.0, 7.5), (7.5, 10.0), and (10.0, ∞).

APPENDIX A
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